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Yun

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(54) **STORYLINE PRESENTATION OF CONTENT**

(71) Applicant: **Amazon Technologies, Inc.**, Reno, NV (US)

(72) Inventor: **Tiffany Yun**, Fremont, CA (US)

(73) Assignee: **Amazon Technologies, Inc.**, Reno, NV (US)

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(52) **U.S. Cl.**
CPC ***G06F 3/048*** (2013.01)

(58) **Field of Classification Search**
CPC G06F 3/0481
USPC 715/738
See application file for complete search history.

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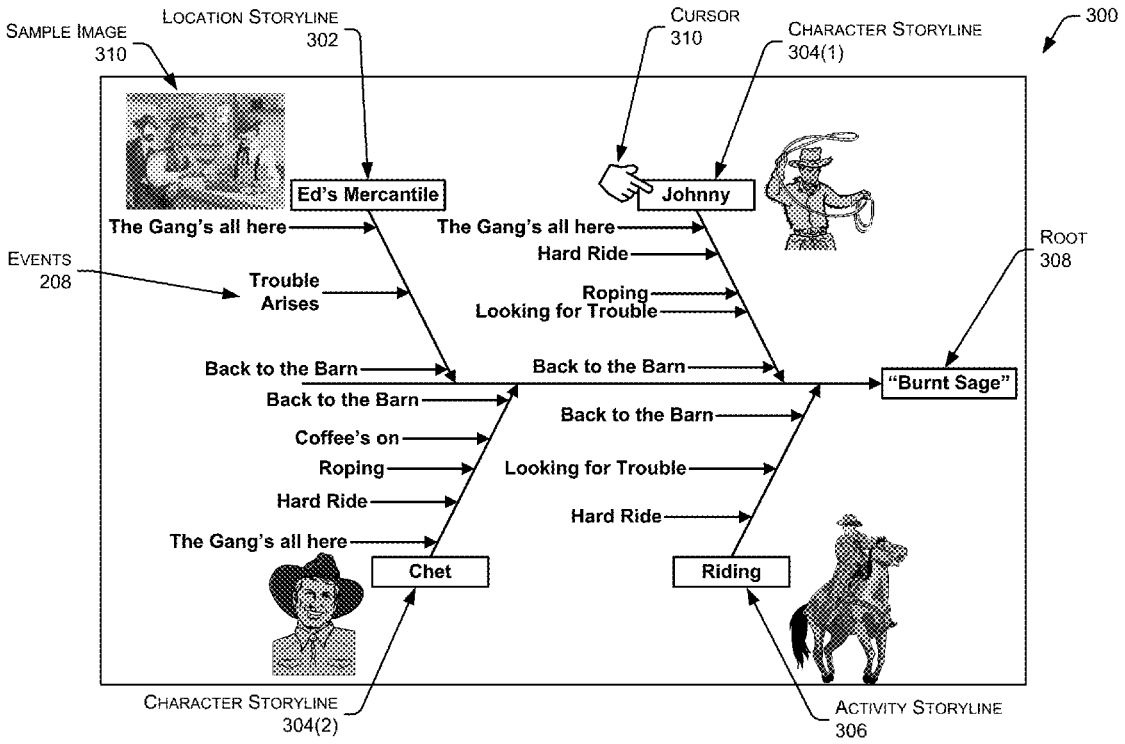
Primary Examiner — Matthew Ell
(74) *Attorney, Agent, or Firm* — Sutherland Asbill & Brennan LLP

(57) **ABSTRACT**

Described herein are systems and methods for generating one or more storylines of content. Tags descriptive of events in the content are generated. Based at least in part on the tags, a storyline is generated from the tags describing the related events throughout the content. Some storylines may comprise multiple tags. A user may select one or more storylines for presentation.

22 Claims, 13 Drawing Sheets



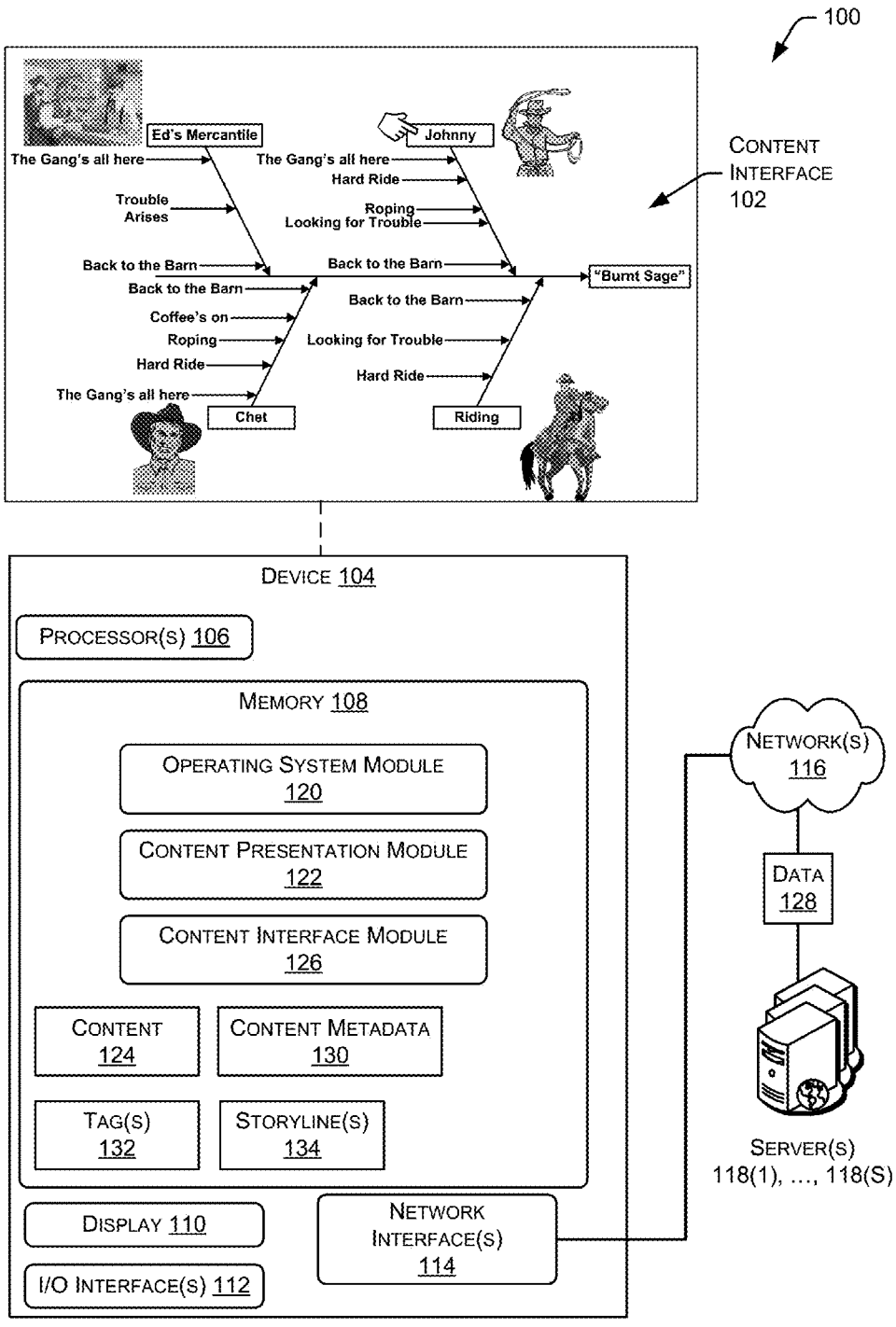

100
Ed's Mercantile
The Gang's all here
Trouble Arises
Back to the Barn
Back to the Barn
Coffee's on
Roping
Hard Ride
The Gang's all here
Chet
Johnny
The Gang's all here
Hard Ride
Roping
Looking for Trouble
Back to the Barn
Back to the Barn
Looking for Trouble
Hard Ride
Riding
"Burnt Sage"
CONTENT INTERFACE 102
DEVICE 104
PROCESSOR(S) 106
MEMORY 108
OPERATING SYSTEM MODULE 120
CONTENT PRESENTATION MODULE 122
CONTENT INTERFACE MODULE 126
CONTENT 124
CONTENT METADATA 130
TAG(S) 132
STORYLINE(S) 134
DISPLAY 110
I/O INTERFACE(S) 112
NETWORK INTERFACE(S) 114
NETWORK(S) 116
DATA 128
SERVER(S) 118(1), ..., 118(S)

FIG. 1

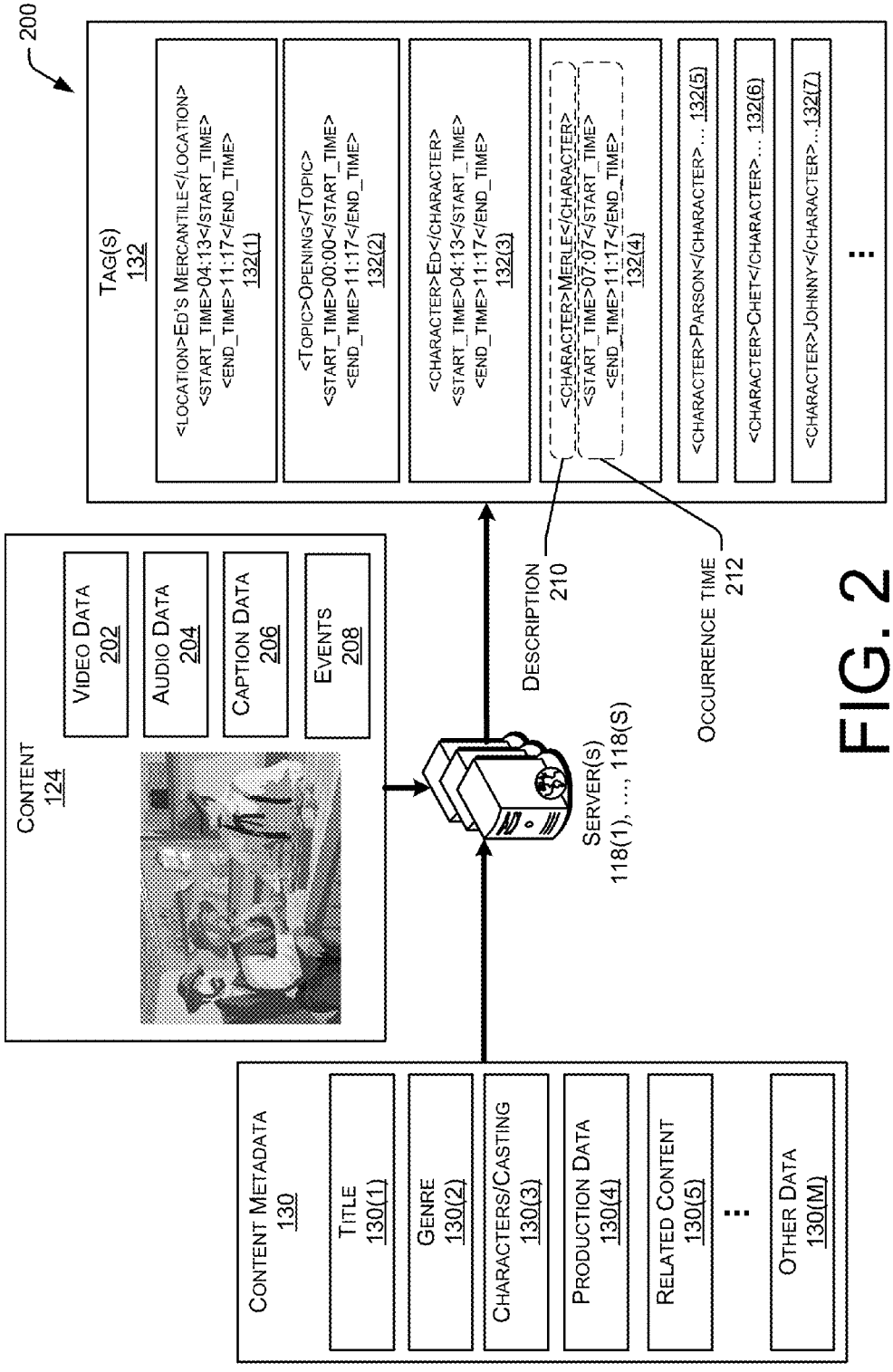

200
TAG(S)
132
<LOCATION>ED'S MERCANTILE</LOCATION>
<START_TIME>04:13</START_TIME>
<END_TIME>11:17</END_TIME>
132(1)
<TOPIC>OPENING</TOPIC>
<START_TIME>00:00</START_TIME>
<END_TIME>11:17</END_TIME>
132(2)
<CHARACTER>ED</CHARACTER>
<START_TIME>04:13</START_TIME>
<END_TIME>11:17</END_TIME>
132(3)
<CHARACTER>MERLE</CHARACTER>
<START_TIME>07:07</START_TIME>
<END_TIME>11:17</END_TIME>
132(4)
<CHARACTER>PARSON</CHARACTER>... 132(5)
<CHARACTER>CHET</CHARACTER>... 132(6)
<CHARACTER>JOHNNY</CHARACTER>...132(7)
CONTENT
124
VIDEO DATA
202
AUDIO DATA
204
CAPTION DATA
206
EVENTS
208
SERVER(S)
118(1), ..., 118(S)
DESCRIPTION
210
OCCURRENCE TIME
212
CONTENT METADATA
130
TITLE
130(1)
GENRE
130(2)
CHARACTERS/CASTING
130(3)
PRODUCTION DATA
130(4)
RELATED CONTENT
130(5)
OTHER DATA
130(M)

FIG. 2

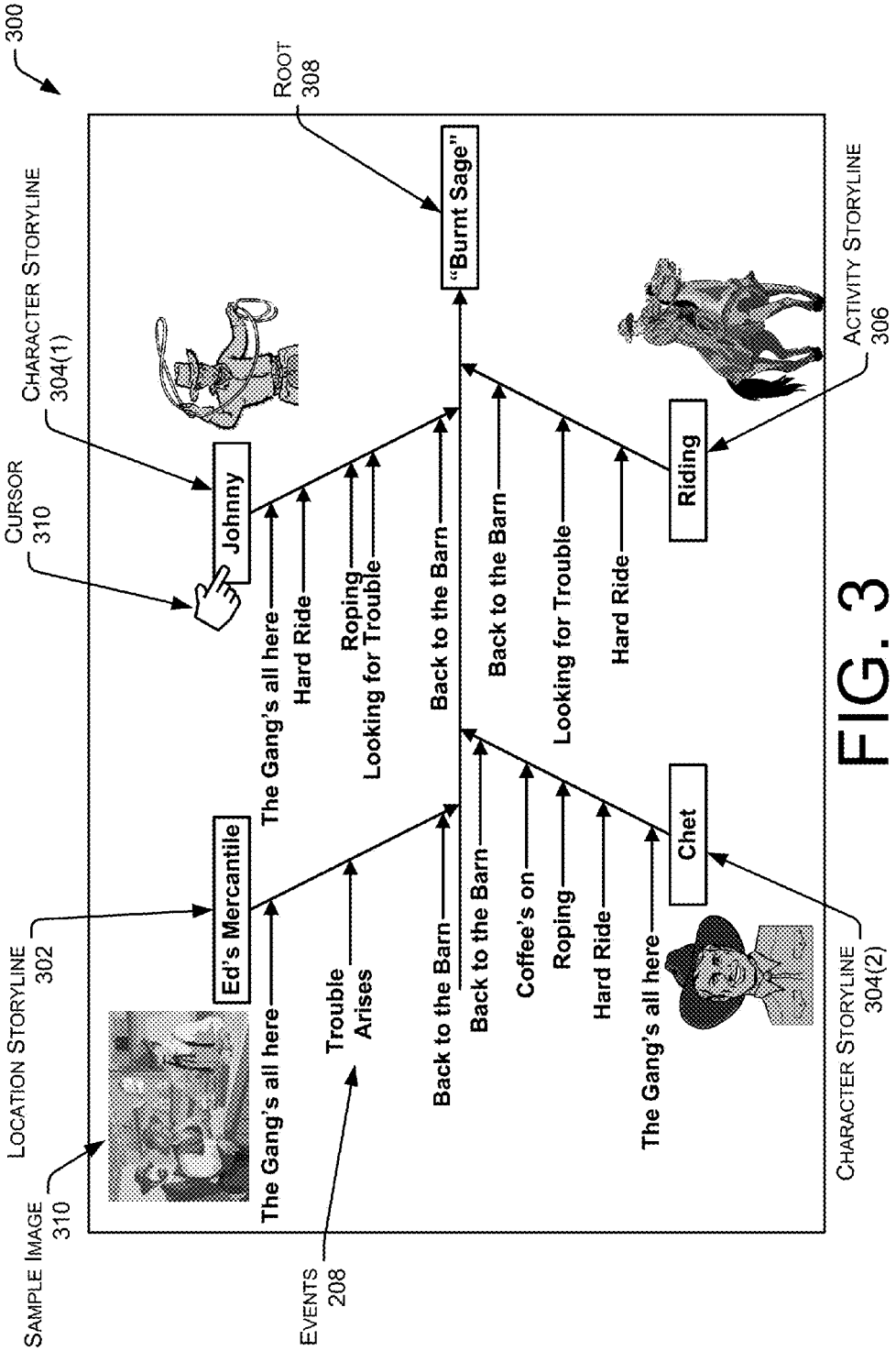

300
ROOT 308
"Burnt Sage"
CHARACTER STORYLINE 304(1)
Johnny
CURSOR 310
The Gang's all here
Hard Ride
Roping
Looking for Trouble
Back to the Barn
Back to the Barn
Looking for Trouble
Hard Ride
Riding
ACTIVITY STORYLINE 306
LOCATION STORYLINE 302
Ed's Mercantile
The Gang's all here
Trouble Arises
Back to the Barn
Back to the Barn
Coffee's on
Roping
Hard Ride
The Gang's all here
Chet
CHARACTER STORYLINE 304(2)
SAMPLE IMAGE 310
EVENTS 208

FIG. 3

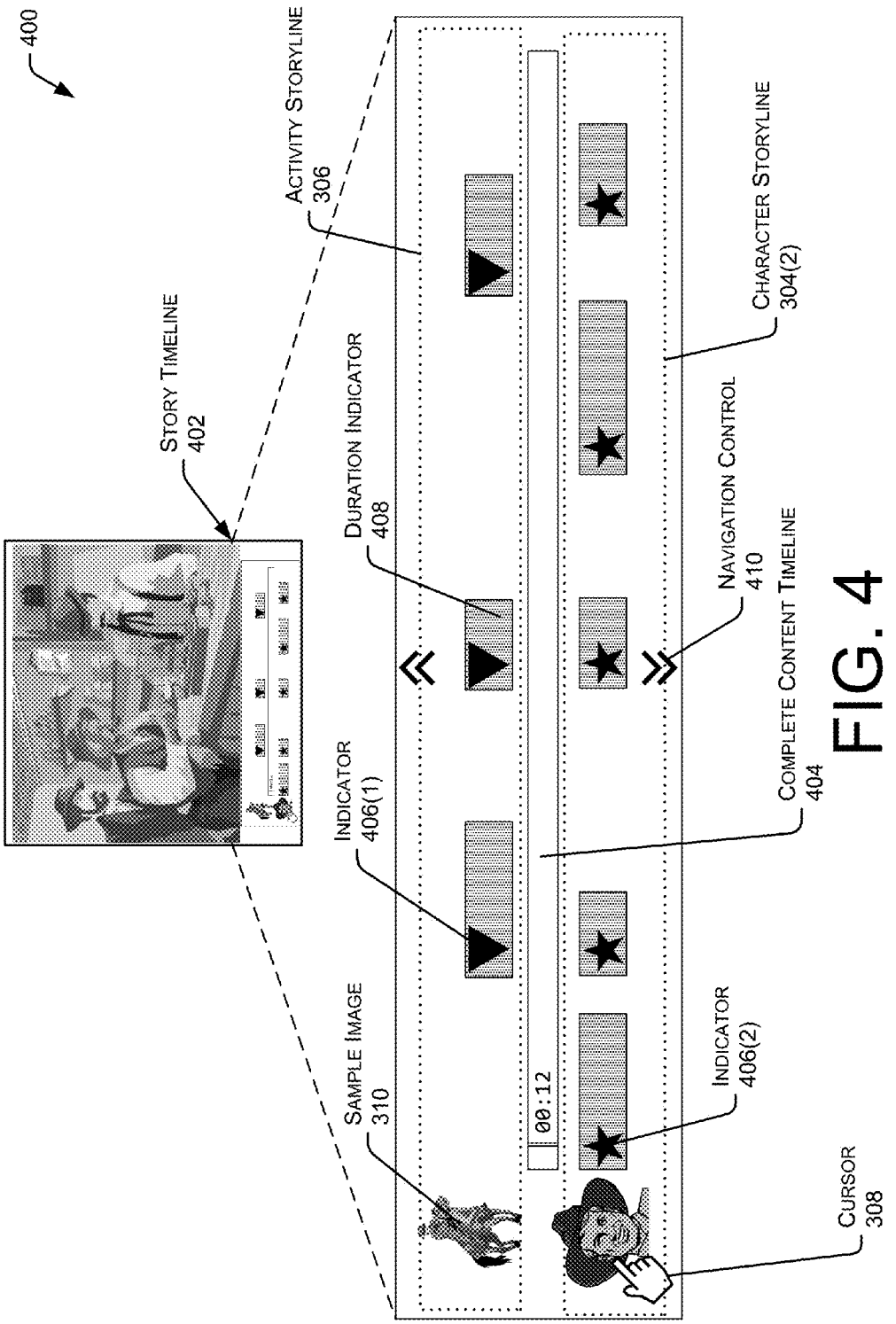

400
ACTIVITY STORYLINE
306
STORY TIMELINE
402
DURATION INDICATOR
408
CHARACTER STORYLINE
304(2)
NAVIGATION CONTROL
410
INDICATOR
406(1)
COMPLETE CONTENT TIMELINE
404
SAMPLE IMAGE
310
00:12
INDICATOR
406(2)
CURSOR
308

FIG. 4

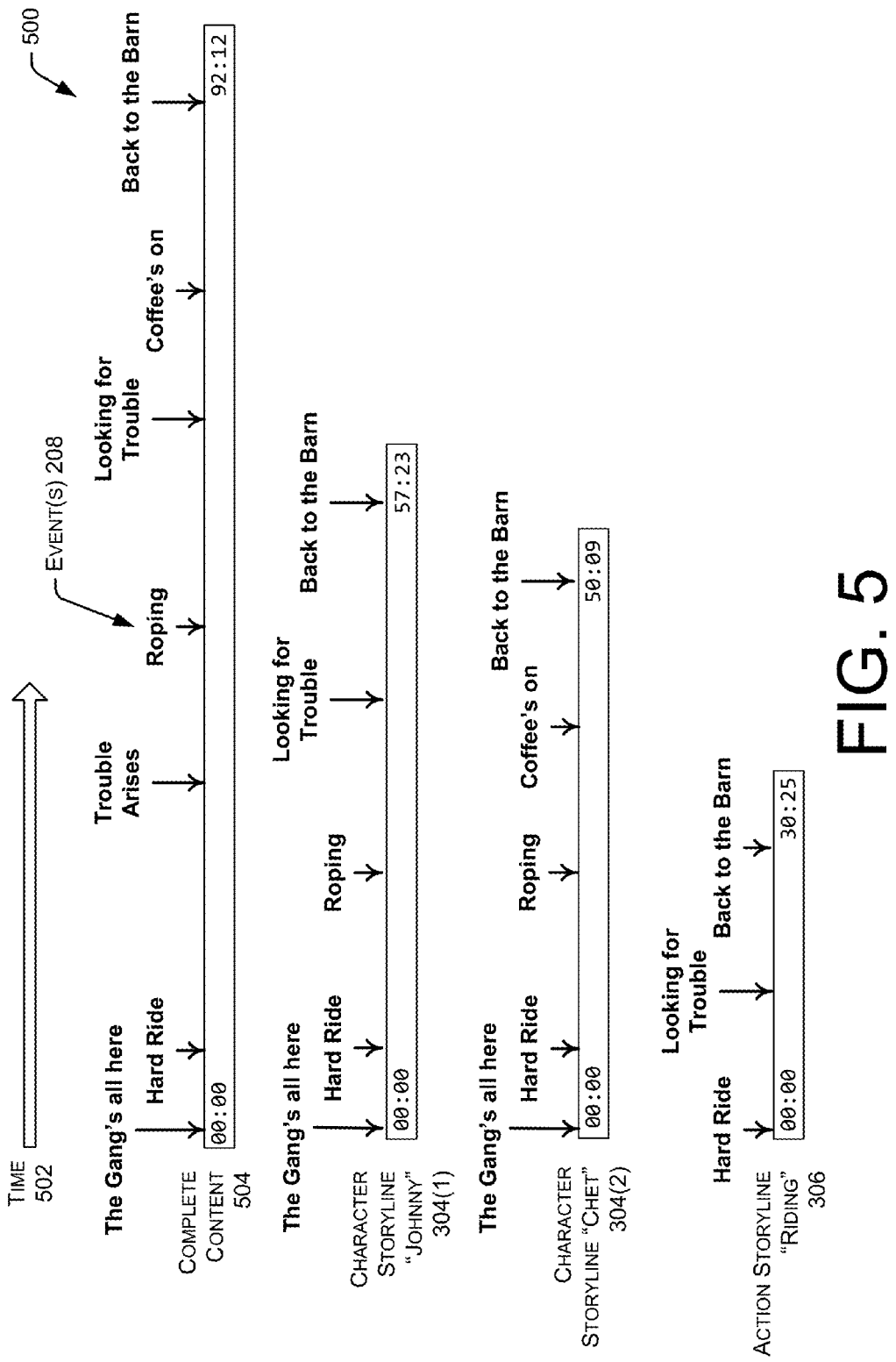

500
TIME
502
EVENT(S) 208
COMPLETE CONTENT 504
00:00
92:12
The Gang's all here
Hard Ride
Trouble Arises
Roping
Looking for Trouble
Coffee's on
Back to the Barn
CHARACTER STORYLINE "JOHNNY" 304(1)
00:00
57:23
The Gang's all here
Hard Ride
Roping
Looking for Trouble
Back to the Barn
CHARACTER STORYLINE "CHET" 304(2)
00:00
50:09
The Gang's all here
Hard Ride
Roping
Coffee's on
Back to the Barn
ACTION STORYLINE "RIDING" 306
00:00
30:25
Hard Ride
Looking for Trouble
Back to the Barn

FIG. 5

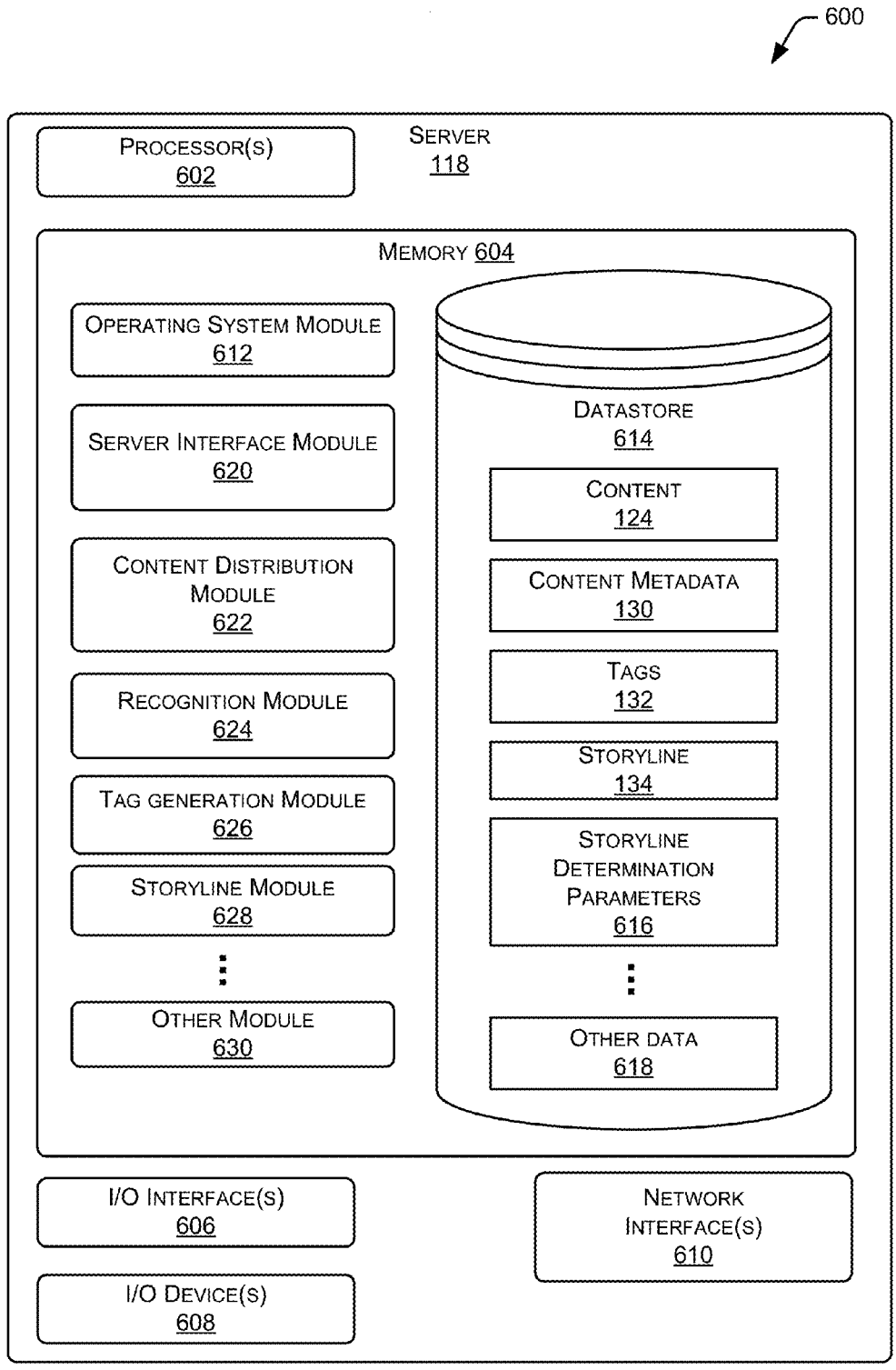

600
PROCESSOR(S)
602
SERVER
118
MEMORY 604
OPERATING SYSTEM MODULE
612
SERVER INTERFACE MODULE
620
CONTENT DISTRIBUTION MODULE
622
RECOGNITION MODULE
624
TAG GENERATION MODULE
626
STORYLINE MODULE
628
OTHER MODULE
630
DATASTORE
614
CONTENT
124
CONTENT METADATA
130
TAGS
132
STORYLINE
134
STORYLINE DETERMINATION PARAMETERS
616
OTHER DATA
618
I/O INTERFACE(S)
606
I/O DEVICE(S)
608
NETWORK INTERFACE(S)
610

FIG. 6

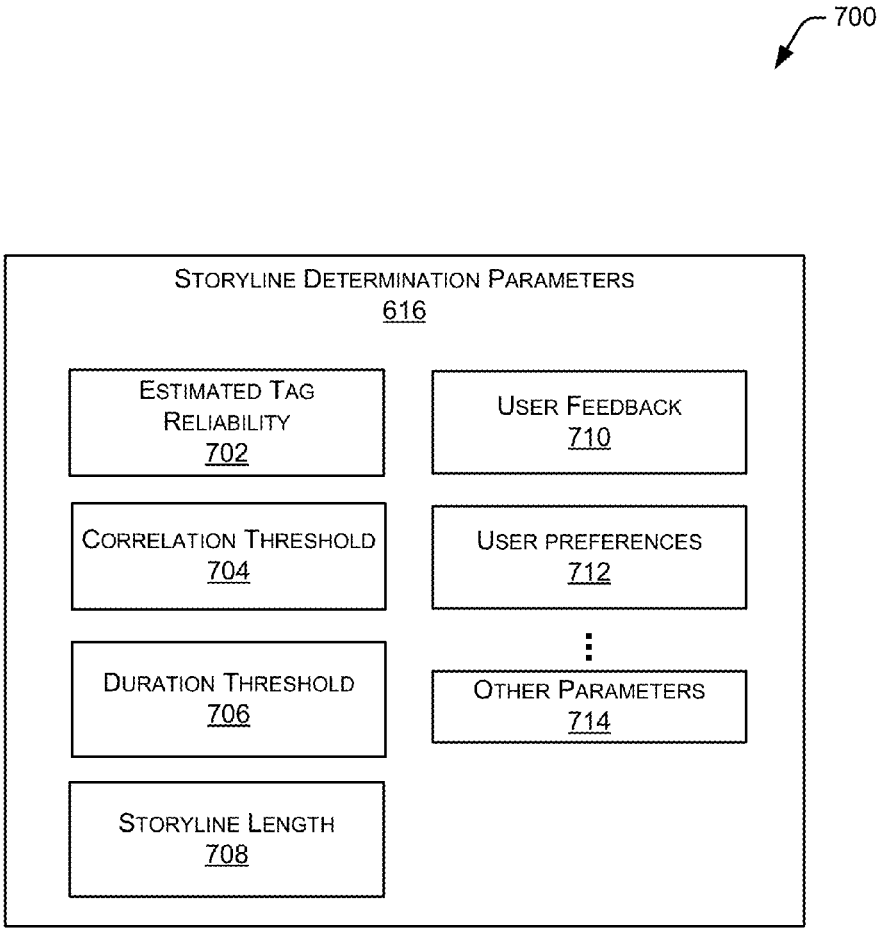

700
STORYLINE DETERMINATION PARAMETERS
616
ESTIMATED TAG RELIABILITY
702
CORRELATION THRESHOLD
704
DURATION THRESHOLD
706
STORYLINE LENGTH
708
USER FEEDBACK
710
USER PREFERENCES
712
OTHER PARAMETERS
714

FIG. 7

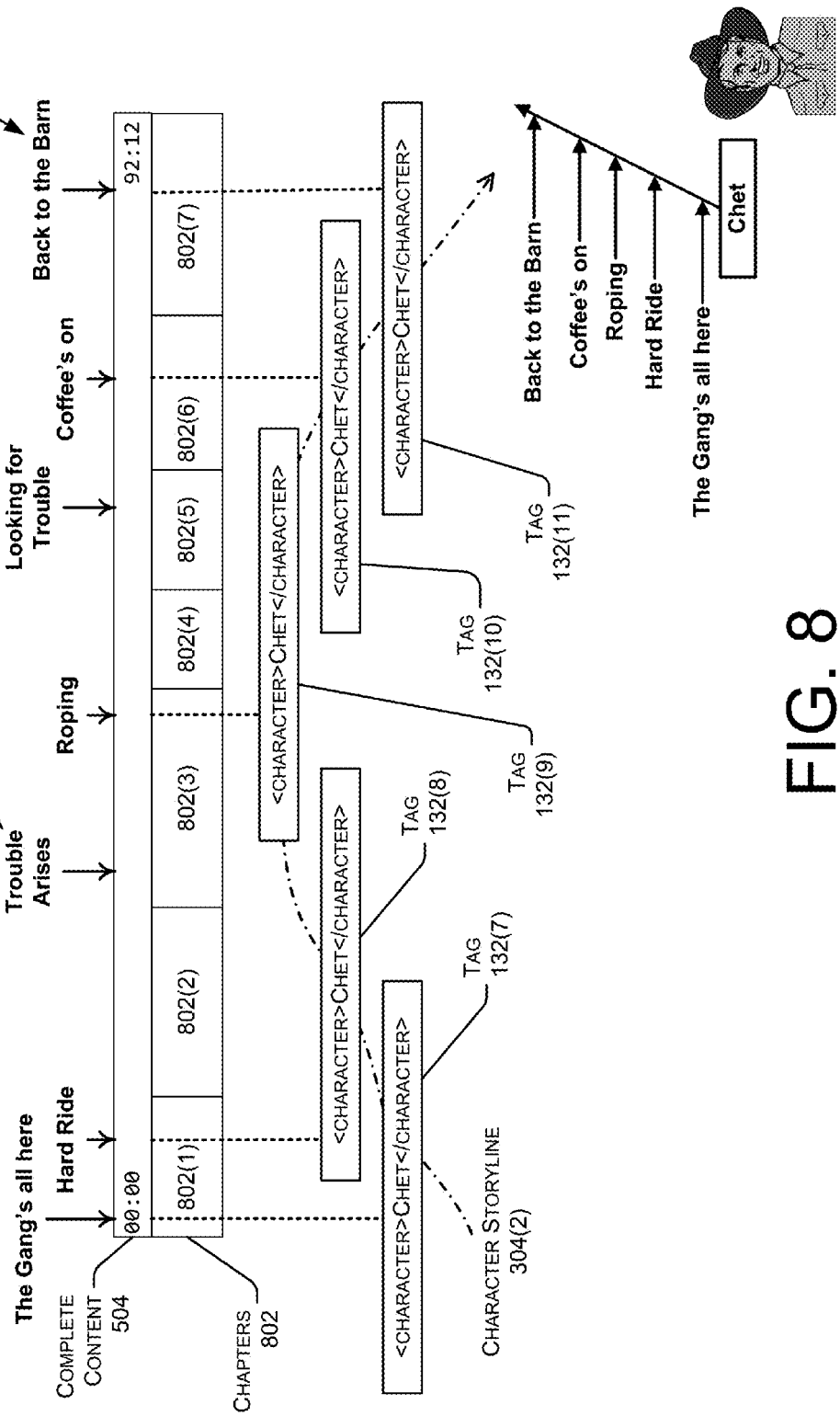

800
EVENT(S) 208
The Gang's all here
Hard Ride
Trouble Arises
Roping
Looking for Trouble
Coffee's on
Back to the Barn
00:00
92:12
802(1)
802(2)
802(3)
802(4)
802(5)
802(6)
802(7)
COMPLETE CONTENT 504
CHAPTERS 802
<CHARACTER>CHET</CHARACTER>
TAG 132(7)
TAG 132(8)
TAG 132(9)
TAG 132(10)
TAG 132(11)
CHARACTER STORYLINE 304(2)
The Gang's all here
Hard Ride
Roping
Coffee's on
Back to the Barn
Chet

FIG. 8

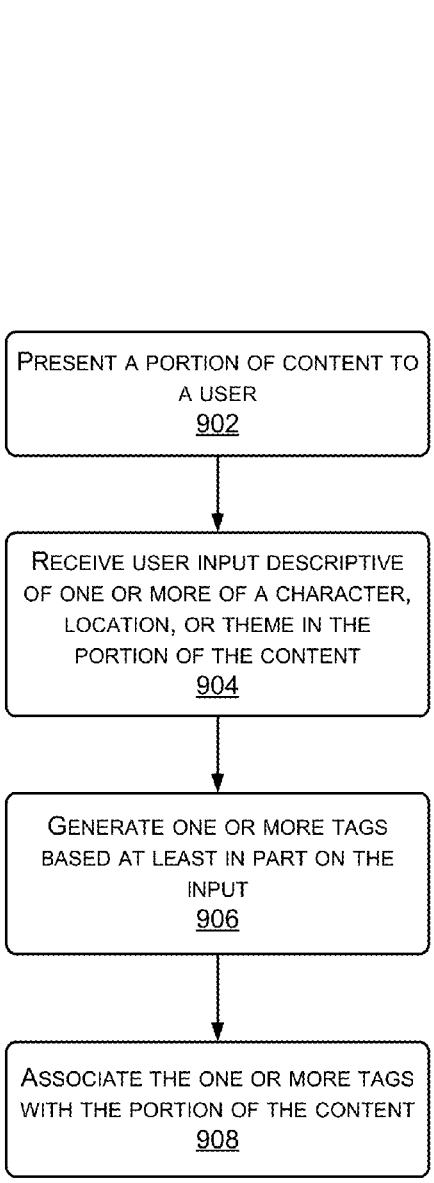

900
PRESENT A PORTION OF CONTENT TO A USER
902
RECEIVE USER INPUT DESCRIPTIVE OF ONE OR MORE OF A CHARACTER, LOCATION, OR THEME IN THE PORTION OF THE CONTENT
904
GENERATE ONE OR MORE TAGS BASED AT LEAST IN PART ON THE INPUT
906
ASSOCIATE THE ONE OR MORE TAGS WITH THE PORTION OF THE CONTENT
908

FIG. 9

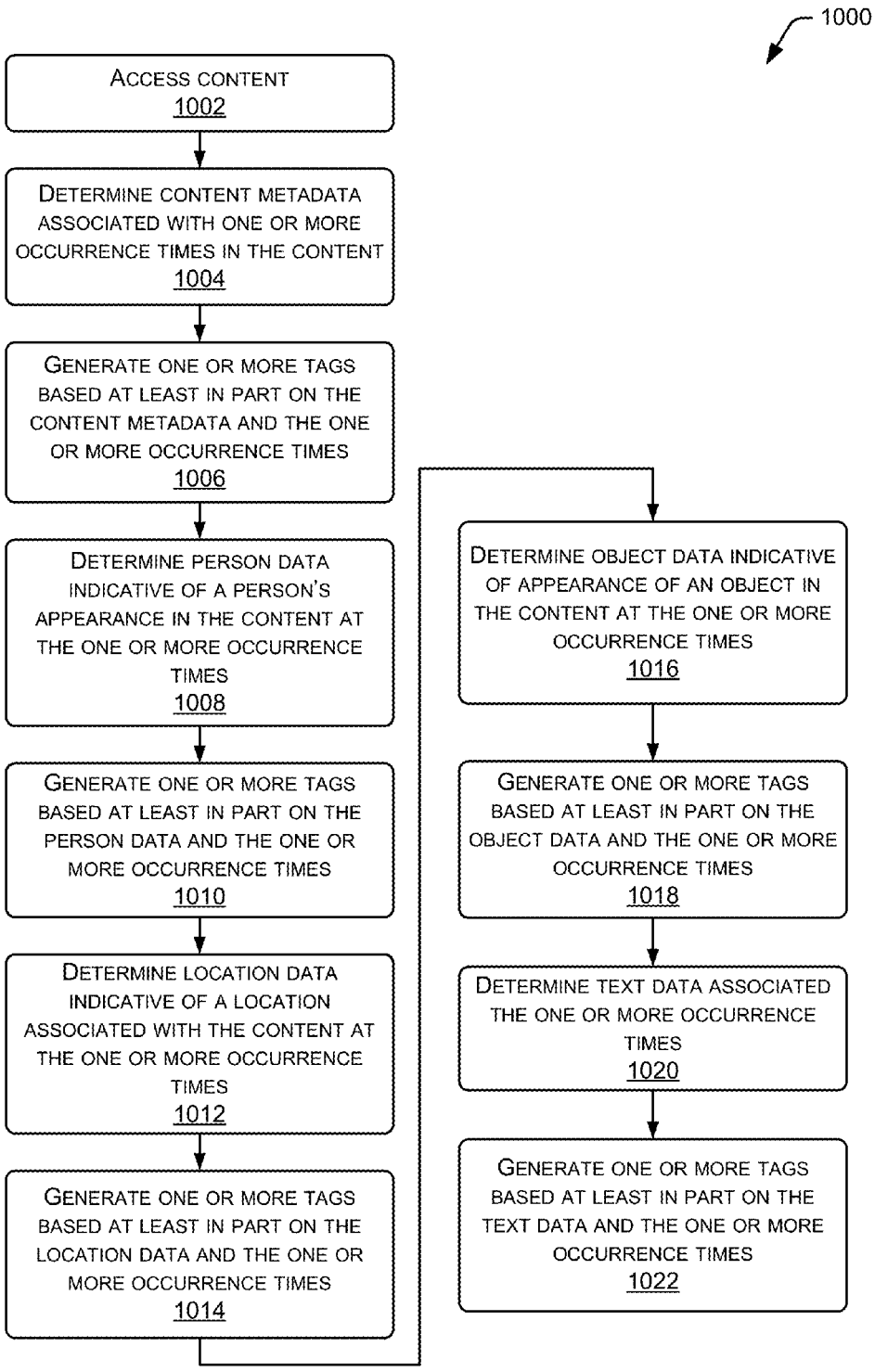

1000
ACCESS CONTENT
1002
DETERMINE CONTENT METADATA ASSOCIATED WITH ONE OR MORE OCCURRENCE TIMES IN THE CONTENT
1004
GENERATE ONE OR MORE TAGS BASED AT LEAST IN PART ON THE CONTENT METADATA AND THE ONE OR MORE OCCURRENCE TIMES
1006
DETERMINE PERSON DATA INDICATIVE OF A PERSON'S APPEARANCE IN THE CONTENT AT THE ONE OR MORE OCCURRENCE TIMES
1008
GENERATE ONE OR MORE TAGS BASED AT LEAST IN PART ON THE PERSON DATA AND THE ONE OR MORE OCCURRENCE TIMES
1010
DETERMINE LOCATION DATA INDICATIVE OF A LOCATION ASSOCIATED WITH THE CONTENT AT THE ONE OR MORE OCCURRENCE TIMES
1012
GENERATE ONE OR MORE TAGS BASED AT LEAST IN PART ON THE LOCATION DATA AND THE ONE OR MORE OCCURRENCE TIMES
1014
DETERMINE OBJECT DATA INDICATIVE OF APPEARANCE OF AN OBJECT IN THE CONTENT AT THE ONE OR MORE OCCURRENCE TIMES
1016
GENERATE ONE OR MORE TAGS BASED AT LEAST IN PART ON THE OBJECT DATA AND THE ONE OR MORE OCCURRENCE TIMES
1018
DETERMINE TEXT DATA ASSOCIATED THE ONE OR MORE OCCURRENCE TIMES
1020
GENERATE ONE OR MORE TAGS BASED AT LEAST IN PART ON THE TEXT DATA AND THE ONE OR MORE OCCURRENCE TIMES
1022

FIG. 10

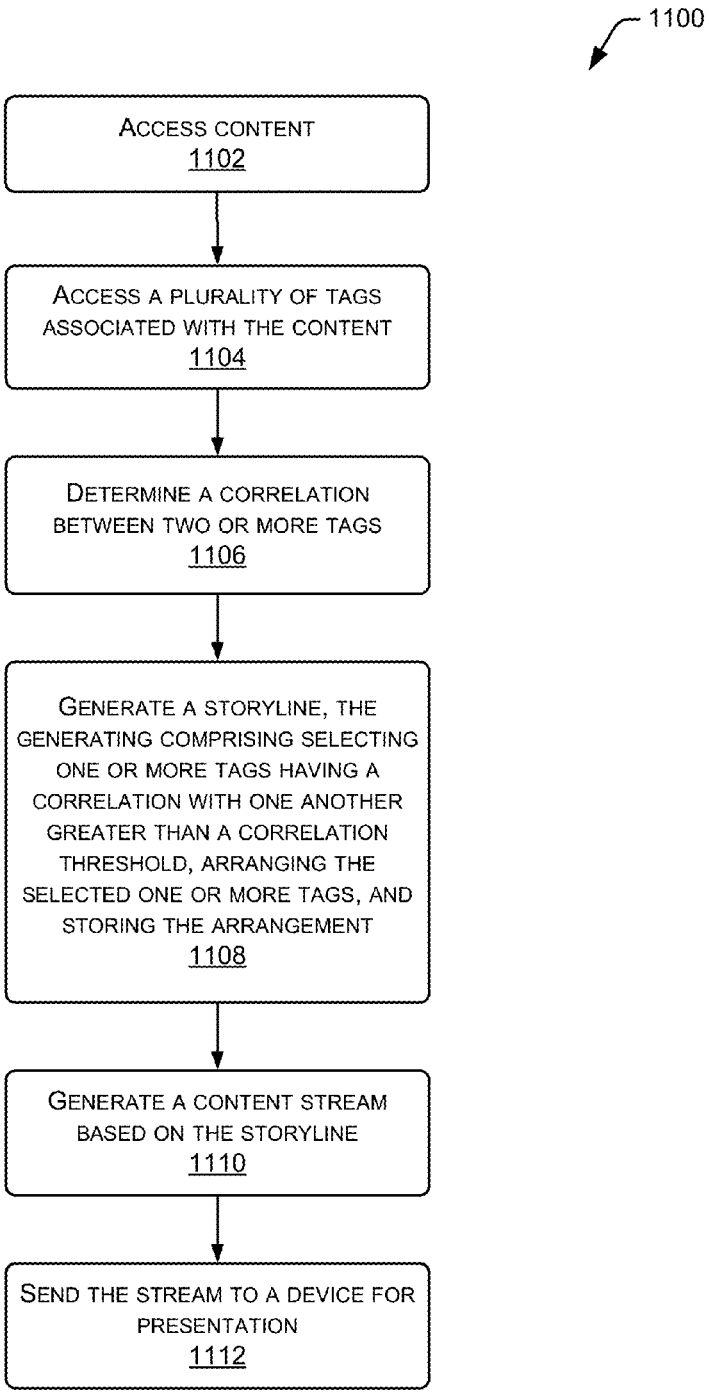

1100
ACCESS CONTENT
1102
ACCESS A PLURALITY OF TAGS ASSOCIATED WITH THE CONTENT
1104
DETERMINE A CORRELATION BETWEEN TWO OR MORE TAGS
1106
GENERATE A STORYLINE, THE GENERATING COMPRISING SELECTING ONE OR MORE TAGS HAVING A CORRELATION WITH ONE ANOTHER GREATER THAN A CORRELATION THRESHOLD, ARRANGING THE SELECTED ONE OR MORE TAGS, AND STORING THE ARRANGEMENT
1108
GENERATE A CONTENT STREAM BASED ON THE STORYLINE
1110
SEND THE STREAM TO A DEVICE FOR PRESENTATION
1112

FIG. 11

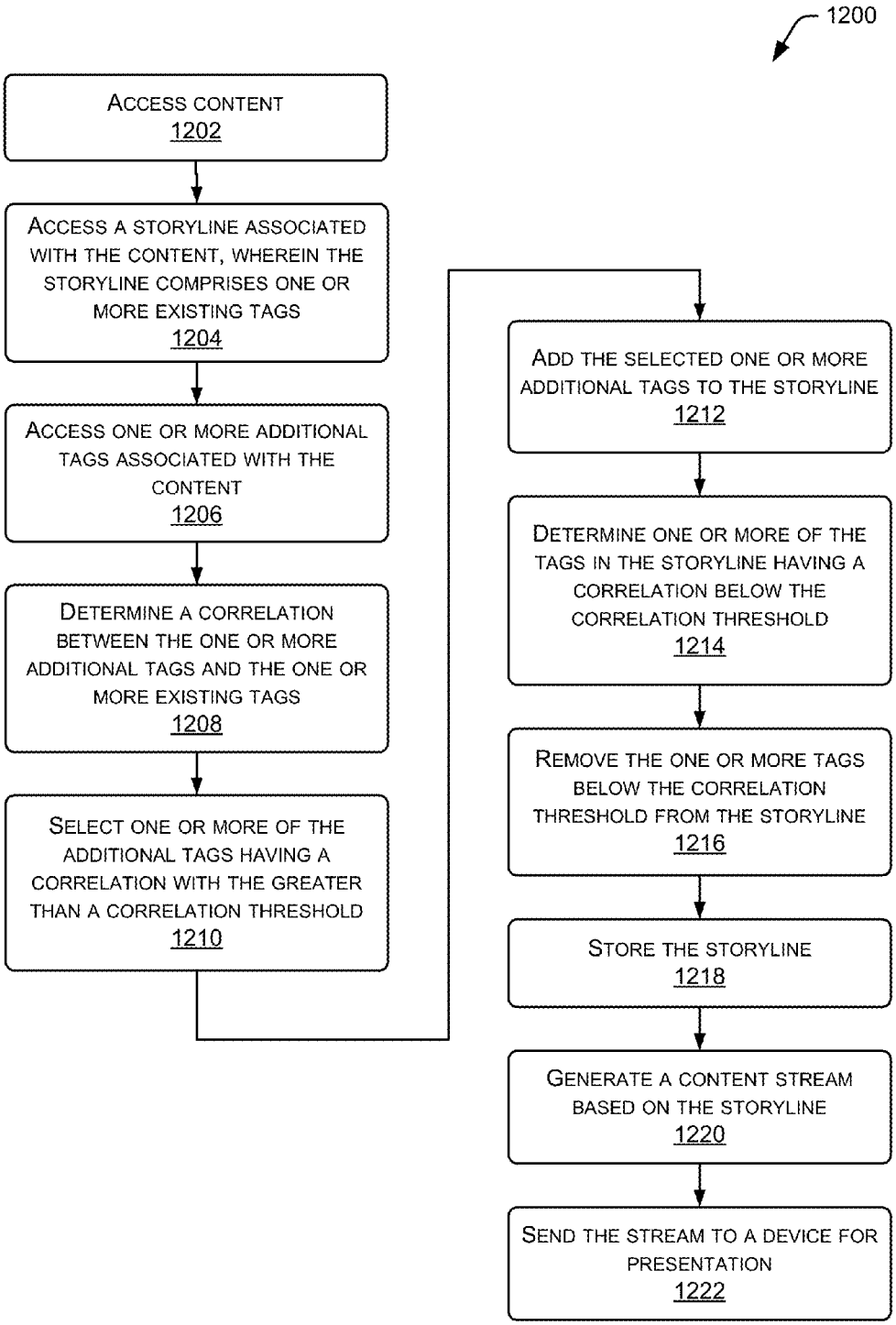

1200
ACCESS CONTENT
1202
ACCESS A STORYLINE ASSOCIATED WITH THE CONTENT, WHEREIN THE STORYLINE COMPRISES ONE OR MORE EXISTING TAGS
1204
ACCESS ONE OR MORE ADDITIONAL TAGS ASSOCIATED WITH THE CONTENT
1206
DETERMINE A CORRELATION BETWEEN THE ONE OR MORE ADDITIONAL TAGS AND THE ONE OR MORE EXISTING TAGS
1208
SELECT ONE OR MORE OF THE ADDITIONAL TAGS HAVING A CORRELATION WITH THE GREATER THAN A CORRELATION THRESHOLD
1210
ADD THE SELECTED ONE OR MORE ADDITIONAL TAGS TO THE STORYLINE
1212
DETERMINE ONE OR MORE OF THE TAGS IN THE STORYLINE HAVING A CORRELATION BELOW THE CORRELATION THRESHOLD
1214
REMOVE THE ONE OR MORE TAGS BELOW THE CORRELATION THRESHOLD FROM THE STORYLINE
1216
STORE THE STORYLINE
1218
GENERATE A CONTENT STREAM BASED ON THE STORYLINE
1220
SEND THE STREAM TO A DEVICE FOR PRESENTATION
1222

FIG. 12

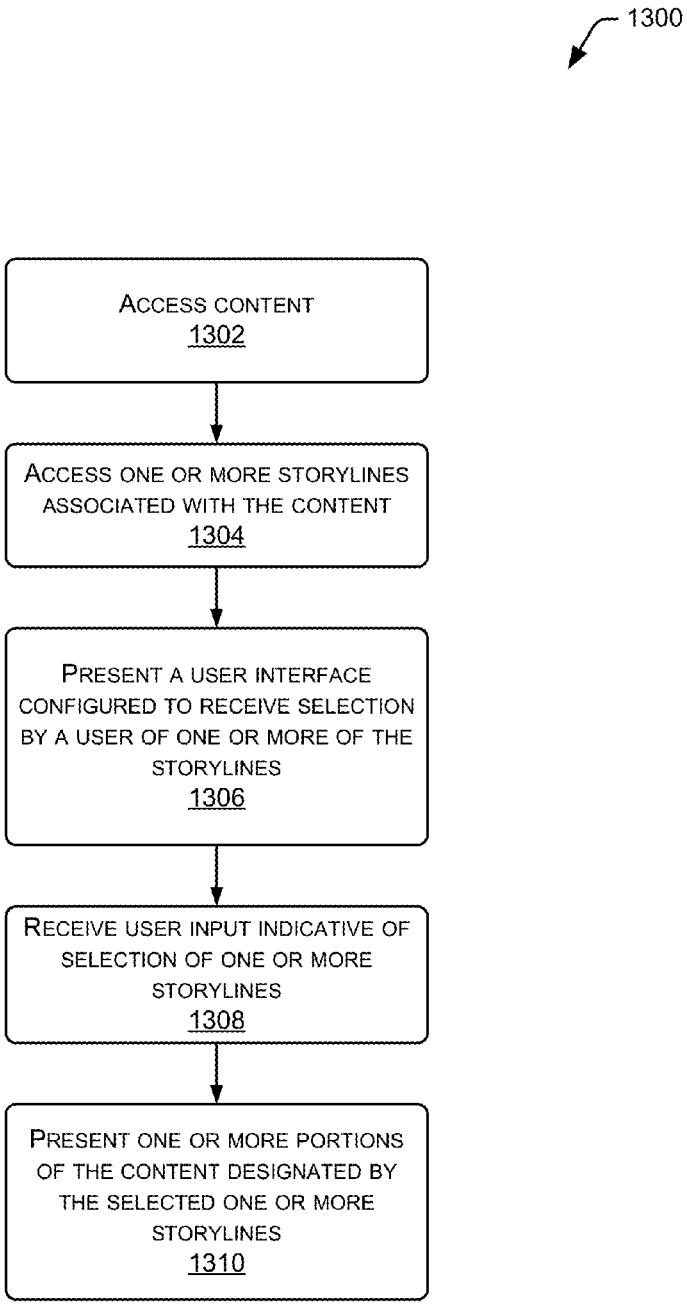

1300
ACCESS CONTENT
1302
ACCESS ONE OR MORE STORYLINES ASSOCIATED WITH THE CONTENT
1304
PRESENT A USER INTERFACE CONFIGURED TO RECEIVE SELECTION BY A USER OF ONE OR MORE OF THE STORYLINES
1306
RECEIVE USER INPUT INDICATIVE OF SELECTION OF ONE OR MORE STORYLINES
1308
PRESENT ONE OR MORE PORTIONS OF THE CONTENT DESIGNATED BY THE SELECTED ONE OR MORE STORYLINES
1310

FIG. 13

STORYLINE PRESENTATION OF CONTENT

BACKGROUND

Broadcast distribution of content such as video, audio, and so forth has formed a particular style of accessing and presenting content to users. A user would consume content transmitted in a serial fashion, being presented with portions of the content whether desired or not. As a result, the user may be faced with wasting time watching or listening to content which is not of interest to them.

Pre-recorded content such as videotapes, digital versatile disks ("DVDs"), audio cassette tapes, and so forth provide users the capability to fast forward or skip ahead to another scene. However, these capabilities are cumbersome and may result in an undesirable user experience.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** illustrates a system for generating storylines associated with content and presenting those storylines.

FIG. **2** illustrates some elements which may be used to generate the tags.

FIG. **3** illustrates a user interface depicting one implementation of storylines associated with the content.

FIG. **4** illustrates a user interface depicting another implementation of storylines associated with the content.

FIG. **5** illustrates content and various storylines with their differing composition.

FIG. **6** illustrates a block diagram of a server configured to generate tags descriptive of the content and from those tags generate storylines.

FIG. **7** is a block diagram of storyline determination parameters which may be used to generate a storyline.

FIG. **8** illustrates a storyline comprising multiple occurrences of a particular tag value throughout the content.

FIG. **9** illustrates a flow diagram of a process for manually generating tags associated with the content.

FIG. **10** illustrates a flow diagram of an automated process for generating tags associated with the content.

FIG. **11** illustrates a flow diagram of a process for generating one or more storylines.

FIG. **12** illustrates a flow diagram of a process for modifying an existing storyline.

FIG. **13** illustrates a flow diagram of a process for presenting one or more storylines.

Certain implementations will now be described more fully below with reference to the accompanying drawings, in which various implementations and/or aspects are shown. However, various aspects may be implemented in many different forms and should not be construed as limited to the implementations set forth herein. Like numbers refer to like elements throughout.

DETAILED DESCRIPTION

User may access a wide variety of content including video, audio, electronic books ("eBooks") and more. This content may be pre-recorded and streamed to devices such as televisions, smartphones, tablets, in-vehicle entertainment systems, and so forth for consumption. Traditionally users have been able to consume content in a linear fashion defined by the broadcaster or content producer. For example, a movie played on a broadcast television channel is presented, and the user watches from beginning to end.

As described above, users have the capability to fast forward or skip ahead in some pre-recorded content, such as videotapes, digital versatile disks ("DVDs"), audio cassette tapes, and so forth. However, these capabilities are cumbersome and may result in an undesirable user experience. For example, a user wishing to skip ahead through video content on a DVD either resorts to fast forwarding through the content or using a skip to the next scene, which may go farther than the user wishes. Furthermore, this interaction still calls for manual intervention.

Described in this application are systems and methods for generating storylines associated with content. Within the content certain events may take place, such as a particular character being on-screen, a particular topic or subject being discussed, particular voice, and so forth. For example, in a video an event may be the lead character being in an image frame. In another example, in an audiobook an event may be dialogue associated with a particular character or voiced by a particular character.

A tag may be associated with these events. The tag stores information descriptive of the event. For example, the tag may contain information identifying a character appearing in the video and a start and stop time for that appearance. One or more of the tags may be embedded within the content or stored in a file associated with the content.

A storyline may be generated from these tags. The storyline is an association of tags, and their underlying events, across time in the content. For example, several tags may indicate the presence of a particular character in various portions of a television episode. A storyline associated with that character may be generated from those tags.

The storyline may be used to present the content on a device to the user. For example, the user may wish to view only portions of the content which include the particular character of interest. Instead of inconveniently manually fast forwarding through the content, the user may select the storyline for that character. During presentation of the storyline, the portions of the content which are designated in the storyline are presented. Portions of the content which are not designated in the storyline are omitted from presentation.

The storylines may be based on a character, actor, location, object, activity, theme, and so forth. For example, a baseball game may include storylines for particular athletes, color commentary, background of the athletes, when the ball is in play, and so forth. A single storyline may be presented, or two or more storylines may be presented concurrently. Continuing the example, the user may select a storyline presenting the performance of a particular athlete or a storyline which presents the performances of all athletes but omits opening and closing ceremonies, color commentary, and other portions of the content.

Storylines may change over time. For example, a storyline may extend across a series of pieces of content including television episodes, movies, and so forth. As new content is added to the series, the associated storylines may be updated to reflect this new content.

Presenting content using the storylines may improve the user experience by allowing the user to consume content which is most meaningful to them. Furthermore, by providing different storylines for the same content, new avenues for production, distribution, licensing, and presentation are opened. For example, users may purchase rights to have different storylines for the same content presented.

Illustrative System

FIG. **1** illustrates a system **100** for generating storylines associated with content. and presenting those storylines of content. As described above, content includes, but is not limited to, video, audio, and electronic books ("eBooks").

For ease of illustration, and not by way of limitation, the figures in this disclosure show content with visual elements, such as a movie or television show. However, in other implementations the content may be audible such as audio books, operas, musical anthologies, and so forth.

A content interface **102** is depicted, as presented by a device **104**. The content interface **102** may present several storylines associated with a particular piece of content. In this example, the particular piece of content is a Western film entitled "Burnt Sage." Storylines are depicted for a location such as "Ed's Mercantile," characters such as "Johnny" and "Chet", and activities such as "Riding." A user may select one or more of these storylines to watch.

The device **104** may be a television, set-top box, smartphone, table, portable computer, desktop computer, in-vehicle entertainment system, and so forth. The device **104** may comprise one or more processors **106**, one or more memories **108**, one or more displays **110**, one or more input/output ("I/O") interfaces **112**, and one or more network interfaces **114**. The device **104** may include other devices not depicted here, such as speakers.

The processor **106** may comprise one or more cores and is configured to access and execute at least in part instructions stored in the one or more memories **108**. The one or more memories **108** comprise one or more computer-readable storage media ("CRSM"). The one or more memories **108** may include, but are not limited to, random access memory ("RAM"), flash RAM, magnetic media, optical media, and so forth. The one or more memories **108** may be volatile in that information is retained while providing power or non-volatile in that information is retained without providing power.

The display **110** is configured to present visual information to the user. The display **110** may comprise a reflective or emissive display configured to present images to the user. An emissive display emits light to form an image. Emissive displays include, but are not limited to, backlit liquid crystal displays, plasma displays, cathode ray tubes, light-emitting diodes, image projectors, and so forth. Reflective displays use incident light to form an image. This incident light may be provided by the sun, general illumination in the room, a reading light, and so forth. Reflective displays include, but are not limited to, electrophoretic displays, interferometric displays, cholesteric displays, and so forth. The display **110** may be configured to present images in monochrome, color, or both. In some implementations, the display **110** of the device **104** may use emissive, reflective, or combination displays with emissive and reflective elements.

The one or more I/O interfaces **112** may also be provided in the device **104**. These I/O interfaces **112** allow for coupling devices such as keyboards, joysticks, touch sensors, cameras, microphones, speakers, haptic output devices, external memories, and so forth to the device **104**.

The one or more network interfaces **114** provide for the transfer of data between the device **104** and another device directly such as in a peer-to-peer fashion, via the network **116**, or both. The network interfaces **114** may include, but are not limited to, personal area networks ("PANs"), wired local area networks ("LANs"), wireless local area networks ("WLANs"), wireless wide area networks ("WWANs"), and so forth. The network interfaces **114** may utilize acoustic, radio frequency, optical, or other signals to exchange data between the device **104** and other devices such as one or more server **118**(1), **118**(2), . . . , **118**(S), another device **104**, and the so forth. As used herein, letters in parenthesis such as "(S")" indicate an integer value greater than zero.

The one or more memories **108** may store instructions or modules for execution by the processor(s) **106** to perform certain actions or functions. The following modules are included by way of illustration, and not as a limitation. Furthermore, while the modules are depicted as stored in the memory **108**, in some implementations, these modules may be stored at least in part in external memory, such as in the server **118** which is accessible to the device **104** via the network **116**. These modules may include an operating system module **120** configured to manage hardware resources such as the I/O interfaces **112** and provide various services to applications or modules executing on the processor **106**.

A content presentation module **122** is configured to present content **124**, such as with the display **110**. The content presentation module **122** may access the content **124** from the memory **108** or retrieve at least a portion of the content **124** from the server **118** using the network **116**. A content interface module **126** is configured to provide a user interface such as the content interface **102** described above. The content interface module **126** provides one or more user interfaces and is configured to accept and process input from the user.

The device **104** may receive data **128** from the server **118** using the network **116**. The data **128** may include one or more of the content **124**, content metadata **130**, one or more tags **132**, or one or more storylines **134**. As described above, the content **124** may comprise audio, video, electronic books, and so forth.

The content metadata **130** provides information about the content such as title, genre, cast of characters, and so forth. The content metadata **130** is discussed in more detail below with regard to FIG. **2**.

The tags **132** provide machine-readable information about events taking place at a particular point in the content **124**. For example, the tag **132** may comprise markup language data indicating a particular character has appeared in the scene and start and stop times for that appearance. The tags **132** are described in more detail below with regard to FIG. **2**.

The storylines **134** are based at least in part on associating tags **132** with similar or the same information across time in one or more pieces of the content **124**. For example, tags **132** which reference the same character may be combined to provide a character storyline **134**. The storylines **134** may also include several different tags **132**.

The storyline **134** may manifest across more than one piece of content **124**. Over time, a collection of one or more tags **132** which define a particular storyline **134** may change. For example, a storyline about a particular character may be modified over time when the character marries. Or a storyline **134** following a plot may be combined with other storylines **134** at later times or be bifurcated as new subplots are formed. As a result, the set of one or more tags **132** which define a storyline **134** in the first few episodes of a series of content **124** may differ from that storyline **134** at the conclusion of the series. Generation, composition, and use of the tags **132** and the storylines **134** are discussed below in more detail.

FIG. **2** illustrates some elements **200** which may be used to generate the tags **132**. The content **124** may comprise one or more of video data **202**, audio data **204**, caption data **206**, or other data such as text of an eBook. The video data **202** may comprise a plurality of image frames, such as a file or portion thereof conforming to the MPEG-4 standard promulgated by the Motion Picture Experts Group ("MPEG"). The audio data **204** may comprise a file or portion thereof

conforming to the MPEG-2 Audio Layer III ("MP3") standard. Caption data **206** may include data encoded as closed captions, open captions, subtitles, and so forth. The caption data **206** may include text corresponding to dialogue present in the video data **202**, include descriptive language as to the events in the scene, and so forth.

Intrinsic within the content **124** are one or more events **208**. The events **208** may include, but are not limited to the appearance of a character, a scene recorded in a particular location, presentation of an object, a particular activity, dialogue or discussion on a particular topic, a particular sound, and so forth. In one implementation, the events **208** are some thing or action perceptible to the user during presentation of the content **124**.

The events **208** may correspond to an entire scene, may occur within a scene, or may occur across several scenes. For example, the event **208** of an appearance of a particular character may extend across three contiguous scenes, while the event **208** of appearance of a particular object may only appear for a few moments within a scene. Each event **208** has at least one corresponding occurrence time which specifies the point or interval in the content at which the event takes place.

The content metadata **130** may include a title **130**(**1**), a genre **130**(**2**), data about characters/casting **130**(**3**), production data **130**(**4**), related content **130**(**5**), and other data **130**(M). The title **130**(**1**) provides data about the title of the content **124**. For example, the title of the content **124** in the illustrations is "Burnt Sage." The genre **130**(**2**) indicates one or more categories to which the content **124** has been designated. Continuing the example, the genre **130**(**2**) of the content **124** may be "Western Adventure."

The character/casting **130**(**3**) data may indicate the cast of characters and actors associated with those characters. For example, the content **124** may have the characters of Ed, Chet, and Johnny, which are played by Clint Woods, John Morrison, and Harry Coburn, respectively. Production data **130**(**4**) may include data such as year filmed, filming locations, and so forth. The related content **130**(**5**) may indicate other pieces of content **124**(**2**), . . . **124**(N) which are affiliated with the content **124**, such as sequels, spin-offs, and so forth.

The server **118**, or in some implementations the device **104**, may generate one or more of the tags **132** based at least in part on the content **124**. The content metadata **130** may also be used as well to generate the tags **132**.

As described above, the tags **132** provide machine-readable information about events **208** taking place at a particular point in the content **124**. In some implementations, this encoding may use a markup language, such as extensible markup language ("XML"). In this illustration, the tags **132** include a description **210** and an occurrence time **212**. The description **210** provides information about the event which is associated with the tag **132**. For example, the tag **132**(**1**) encodes information describing that the scene takes place in "Ed's Mercantile". The occurrence time **212** may specify a particular point in time in the content, or an interval within the content, such as shown here.

In some implementations the tags **132** may include reference information, associating the tag with a particular portion of the content **124** or designating the particular portion of the content at which the event described by the tag occurs. For example, as shown here the occurrence time **212** specifies a start time and an end time for when the location of "Ed's Mercantile" is presented. While times are shown, other referents may be used such as frame number, byte count, and so forth.

The tag **132** may include a reference to one or more occurrence times in the content. For example, a single tag **132** with the description **210** of "Chet" may contain information as to all of the occurrence times at which "Chet" appears in the content **124**.

In other implementations, the tags **132** may be placed into a data structure or otherwise associated with particular portions of the content **124**. For example, the tags **132** may be embedded within the video data **202**.

A given portion of a scene of the content **124** may have many tags **132** associated with it, or none whatsoever. For example, the end credits of a movie may have tags **132** indicating the topic of "credits" while a busy street scene may have many tags **132** describing the actors, location, objects, and so forth.

Once the tags **132** associated with the content **124** are available, one or more storylines **134** may be generated. Generation of the tags **132** and the storylines **134** is discussed below in more detail with regard to the server in FIG. **6**.

FIG. **3** illustrates a user interface **300** depicting one implementation of storylines **134** associated with the content **124**. This user interface **300** may be presented by the content interface module **126**.

Four storylines **134** are depicted in this illustration. A location storyline **302**, two character storylines **304**(**1**)-(**2**), and an activity storyline **306**. As illustrated, the storylines **134** are made up of a series of events **208**. In this representation, the storylines **134** are associated with a root **308** which indicates the title **130**(**1**) of the content **124**. In some implementations the storylines **134** may extend across multiple pieces of content. For example, the root **308** and the storylines **134** may extend across the movie "Burnt Sage" as well as the **127** episodes of the television series "Burnt Sage Revisited," and a sequel movie "Burnt Sage, the Sodbusters." Furthermore, the storylines **134** may include different types of content. For example, the storylines **134** may include different forms of content, such as video, audio-only content such as audiobooks, text such as from eBooks, and so forth which are in the "Burnt Sage" series.

The storylines **134** in this representation may have a sample image **310**. The sample image **310** may be acquired from a portion of the content present in the respective storyline. For example, for the location storyline **302** the sample image **310** is of a scene in which the location "Ed's Mercantile" is shown.

The location storyline **302** comprises events **208** as described by tags **132** which relate to a particular location. This may be a particular location within the content **124** or a particular location used in generating the content **124**. For example, the location storyline **302** may be the name of the location in the content, such as "Ed's Mercantile," or may an actual location used during filming, such as "Backlot Stage **4**" in Burbank, Calif.

The character storylines **304**(**1**) and **304**(**2**) comprise events **208** as described by tags **132** which relate to one or more characters. For example, the storyline **304**(**1**) is based on the tags **132** which reference the character "Johnny" while the storyline **304**(**2**) is based on those tags **132** which reference the character "Chet." As mentioned above, the storylines **134** may extend across multiple pieces of content. For example, the storyline **304**(**1**) for the character "Johnny" may include occurrences and information from that character's other appearances in "Burnt Sage Revisited" and "Burnt Sage, the Sodbuster."

The activity storyline **306** comprises events **208** as described by tags which relate to one or more actions or

activities. For example, as shown here the activity of "Riding" will associate into a single storyline those events **208** which have tags associated with cowboys as well as tags associated with horses.

A cursor **310** or other indicator may be used to provide the user with feedback as to which of the one or more storylines **134** are selected for presentation. As described above, the user may select for presentation a single storyline **134** or several storylines **134**. In one implementation, the presentation may be serial in that a first storyline **134(1)** is presented, then **134(2)**, and so forth. In another implementation, the user may select to present the multiple storylines **134** concurrently. For example, the user may select to present the character storyline **304(1)** about "Johnny" along with the activity storyline **306** of "riding" so that, while watching the movie, the user will see content **124** which includes Johnny or horseback riding.

FIG. **4** illustrates a user interface **400** depicting another implementation of presenting storylines **134** associated with the content **124**. In this illustration a story timeline **402** is depicted on the display **110**.

In this implementation, an element representative of the complete content timeline **404** is depicted, along with a current location being presented. This element provides a linear timeline of the content. Positions relative to the complete content timeline **404** may be proportionate to the time within the content **124**. For example, a position at the extreme left of the complete content timeline **404** is associated with the beginning of the content **124** while the extreme right is associated with the end. In this example, the location currently being presented on the display **110** is at time 00:12.

Here, the character storyline **304(2)** and the activity storyline **306** are presented. Indicators **406** are used to represent locations within the content **124** at which the events **208** specified in the tags **132** are present. For example, indicator **406(1)**, illustrated as upside down triangles, corresponds to portions of the content **124** in which horseback riding has been tagged. Similarly, indicator **406(2)**, illustrated as a star, corresponds to portions of the content **124** in which the character "Chet" appears.

A duration indicator **408** of the events **208** as tagged may be provided. As described above the tags **132** may include information such as start and end times within the content **124**. From this information, or similar information, the duration of the event **208** may be determined and the duration indicator **408** may be presented.

Navigation controls **410** or other controls may be presented in the user interface **400**. These controls may allow the user to scroll or otherwise move among the different storylines available. In some implementations, the user interface **400** may also present controls allowing the user to build a storyline for tags **132** associated with the content **124**.

Similar to that described above with regard to FIG. **3**, in some implementations a cursor **310**, sample image **310**, and so forth may be presented in the user interface **400**.

FIG. **5** illustrates content **124** and various storylines **134** with their differing compositions. The user may select one or more storylines **134** for presentation. During presentation of the selected storylines **134**, portions of the content **124** which are designated by the tags **132** in the storylines **134** are presented. In comparison, portions not designated by the tags are not presented.

In this illustration time increases from left to right, as indicated by arrow **502**. Depending upon the portions of the content **124** indicated by the tags **132** in the storylines **134**, the total duration of the content as presented to the user may vary.

In this illustration, the various events **208** are depicted at their relative positions within the content **124**. A representation of complete content **504** is depicted. Should the user select to present the content **124** without applying any of the storylines **134**, the entire movie "Burnt Sage" would run a total of 92:12 (minutes:seconds).

In comparison, the character storyline **304(1)** for "Johnny" comprises a subset of the events **208**, in particular those events **208** which have tags **132** implicating "Johnny." For example, these may be tags **132** indicating that "Johnny" is in the picture, or is a subject of dialogue by other characters. The character storyline **304(1)**, when presented from beginning to end is shorter than the complete content **504**, finishing in 57:23.

The character storyline **304(2)** for "Chet" comprises different events **208** than those associated with "Johnny". As a result, this storyline **304(2)** includes events **208** such as "Coffee's on" while omitting "Looking for trouble".

Finally, as depicted here, the action storyline **306** is briefest of all, with only three events **208** involving horseback riding in this piece of content **124**. As a result, the total running time for this storyline **306** is 30:25. Portions of the content **124** which do not have tags **132** indicating horseback riding, such as "the Gang's all here" or "coffee's on" do not appear in this storyline **306**, and thus would not be presented to the user.

By selecting one or more storylines **134** of particular interest, the user may be able to consume content they might not otherwise have time for. For example, the user may be a fan of the character "Chet" but only has about an hour to watch the movie. By selecting the character storyline **304(2)**, the user is able to consume the portions of the content of particular interest and within the available time. Should the user wish to later view another storyline **134**, or view the complete content **504**, those options may also be available.

FIG. **6** illustrates a block diagram **600** of the server **118** configured to generate tags **132** descriptive of the content **124**, and from those tags **132** generate storylines **134**. The server **118** may comprise one or more processors **602**, one or more memories **604**, one or more input/output ("I/O") interfaces **606**, one or more I/O devices **608**, and one or more network interfaces **610**. The server **118** may include other devices not depicted.

The processor **602** may comprise one or more cores and is configured to access and execute at least in part instructions stored in the one or more memories **604**. The one or more memories **604** comprise CRSM. The one or more memories **604** may include, but are not limited to, random access memory ("RAM"), flash RAM, magnetic media, optical media, and so forth. The one or more memories **604** may be volatile in that information is retained while providing power or non-volatile in that information is retained without providing power.

The one or more I/O interfaces **606** may also be provided in the server **118**. These I/O interfaces **606** allow for coupling the I/O devices **608** such as keyboards, displays, touch sensors, external memories, cryptographic processors, and so forth to the server **118**.

The one or more network interfaces **610** provide for the transfer of data between the server **118** and another device directly such as in a peer-to-peer fashion, via the network **116**, or both. The network interfaces **610** may include, but are not limited to, PANs, LANs, WLANs, WWANs, and so forth. The network interfaces **610** may utilize acoustic, radio

frequency, optical, or other signals to exchange data between the server **118** and another device such as router, network switch, another server **118**, and so forth.

The one or more memories **604** may store instructions or modules for execution by the processor **602** to perform certain actions or functions. The following modules are included by way of illustration, and not as a limitation. Furthermore, while the modules are depicted as stored in the memory **604**, in some implementations, these modules may be stored at least in part in external memory, such as in other devices which are accessible to the server **118** via the network **116**. These modules may include an operating system module **612** configured to manage hardware resources such as the I/O interfaces **606** and provide various services to applications or modules executing on the processor **602**.

The one or more memories **604** may also store a datastore **614**. The datastore **614** may comprise one or more databases, files, linked lists, or other data structures. The datastore **614** may be configured to store content **124**, content metadata **130**, tags **132**, storylines **134**, storyline determination parameters **616**, or other data **618**. The storyline determination parameters **616** are used to determine the association between tags **132** and their inclusion into the storyline **134**. The storyline determination parameters **616** are discussed in more detail below with regard to FIG. **7**.

A server interface module **620** may be stored in the memory **604** and configured to provide a user interface, application interface, or both, which handles inputs and outputs from the user, the device **104**, and so forth during operation of the server **118**. For example, the server interface module **620** may be configured to provide an application programming interface which the content presentation modules **122** may use to access the server **118** and initiate presentation of one or more of the storylines **134**.

A content distribution module **622** may be stored in the memory **604**. The content distribution module **622** is configured to manage and provide content **124** to the device **104**. The content distribution module **622** may apply one or more storylines **134** to the content **124** for presentation. The content **124** may be provided to the device **104** for presentation using a transfer of a complete file representative of the presented content, or by streaming portions of the content **124** to the device.

A recognition module **624** stored in the memory **604** is configured to recognize events **208** or event constituents within the content **124**. The recognition of events **208** or event constituents may be manual, automatic, or a combination thereof. The recognition module **624** generates data about components of the events **208**. The recognition module **624** may provide facial recognition, voice recognition to identify a particular speaker, speech recognition to transform spoken words to text for processing, object recognition, optical character recognition, and so forth. For example, the recognition module **624** may be configured to identify the frames in which a particular character is visible. In another example, the recognition module **624** may be configured to detect the presence of a particular trademark on objects within the images.

The recognition module **624** may also access data such as the content metadata **130** to generate data about the components of the events **208**. For example, the recognition module **624** may identify speech from a particular actor, and using the content metadata **130** associate the dialogue of that particular actor with the actor's character in the content **124**.

The memory **604** may also store a tag generation module **626** configured to use data provided by the recognition module **624**, the content metadata **130**, and so forth to generate one or more of the tags **132**. For example, the tag generation module **626** may use data from the recognition module **624** to associate a portion of the content **124** with the character of "Johnny" and generate the corresponding tag **132**(**7**). The generation of the tags **132** may be manual, automatic, or a combination thereof.

The tag generation module **626** may be configured to look for data embedded within the content **124**. An image frame with a barcode or other data may be inserted into the content **124** which contains information which may be used to generate the tag **132**. For example, a single frame containing a barcode with information such as the name of a character appearing in the subsequent frames may be provided by a production company or content distributor. During presentation, the single frame may be imperceptible to the user. In some implementations, the content distribution module **622** may be configured to remove these embedded frames prior to presentation by the device **104**.

A storyline module **628** is stored in the memory **604**. The storyline module **628** is configured to generate one or more storylines **134** based on one or more of the tags **132** which are descriptive of the events **208** in the content **124**. The storyline module **628** may be configured to adjust boundaries of the portion of the content **124** specified by the tags **132**. For example, the tag **132**(**7**) may specify time a start time of 7:07 and an end time of 11:17. However, the storyline module **628** may adjust the storyline **134** such that during presentation the content is provided from 7:00 to 12:00.

In another implementation, the storyline module **628** may be configured to adjust the boundaries of the portion of the content **124** to correspond to scene changes, changes in camera views, visual effects, blanking signals, and so forth. For example, the storyline module **628** may be configured to change the start time of the tag **132**(**7**) to 6:56 at which time there is a change in camera angle and the end time of the tag to 13:15 to correspond with a transition between scenes.

The storyline module **628** may also be configured to provide or designate for presentation transition effects. For example, a fade to black may be used to exit one portion of content **124** designated by the tag **132**(**7**) while a fade in from black to the image may be used to present the next portion of content **124** in the storyline **134**. In other implementations other transitions effects may be used. For example, audio may be ramped down or ramped up in an audiobook, or a page may be inserted into an eBook. The adjustment of boundaries, insertion of transition effects, and other actions by the storyline module **628** may be provided to improve the overall user experience. For example, the insertion of transition effects may be used to prevent jarring transitions from one portion of the content **124** to the next during presentation.

The storyline module **628** may be configured to generate the storylines **134** in advance of distribution, or on demand. The generation of the storylines **134** may be based at least in part on one or more of the storyline determination parameters **616** which are described below with regard to FIG. **7**.

Other modules **630** may be present in the memory **604** as well. For example, a digital rights management module may be present and configured to manage access rights to the content **124**.

FIG. **7** is a block diagram **700** of storyline determination parameters **616** which may be used by the storyline module **628** to generate one or more storylines **134**. Depending upon the quality of the tags **132**, a particular storyline **134** may be

useful or difficult to follow. The storyline module **628** may use one or more storyline determination parameters **616** to generate which tags to include in the particular storyline **134**. For example, a tag **132** may be generated by another character talking about "Chet" briefly, but that portion of the content **124** may not be worthwhile to include into the "Chet" character storyline **304**(**2**).

The storyline determination parameters **616** may include estimated tag reliability **702**. The estimated tag reliability **702** provides a metric as to how accurately the tag **132** relates to the actual event **208**. For example, a manually entered tag **132** may be given a high reliability while a tag **132** generated automatically and based on several variable inputs such as voice and speech recognition may be assigned a lower estimated tag reliability **702**. The estimated tag reliability **702** may also be defined as a confidence interval for the data upon which the tag **132** is based. In some implementations, a tag reliability threshold may be specified such that tags are included in a particular storyline when they meet or exceed the threshold.

A correlation threshold **704** may specify a tolerance or correlation factor by which different tags **132** may be associated with one another in the same storyline **134**. For example, the tag **132**(**1**) for the location "Ed's Mercantile" may have a correlation with the tag **132**(**3**) for the character "Ed" which is above the threshold. As a result, a storyline **134** may be generated which includes both tags **134**(**1**) and **132**(**3**).

A duration threshold **706** may be specified. The storyline module **628** may be configured to disregard during storyline **134** generation those tags **132** which have a duration below the threshold. For example, a tag **132** for an event **208** comprising a single mention of the character "Chet" may not be included in the character storyline **304**(**2**).

A storyline length **708** may be specified which defines a minimum, maximum, or minimum and maximum length for the storyline. For example, the storyline length **708** may be set to 60 minutes. The storyline module **628** may select the tags **132** from those with the highest estimated tag reliability **702** to the least, building the storyline **134** until the storyline length **708** of 60 minutes is reached.

User feedback **710** may be used to generate the storylines **134**. The users may provide feedback as to whether a particular portion of the storyline **134**. This feedback may include selection that the content is irrelevant, good, bad, or another rating or indication about the desirability to include of that portion of the content **124**. For example, a portion of the content **124** which is ranked by a threshold number of users may be removed from the storyline **134**. The user feedback **710** may also include manually generated or modified tags **132**.

User preferences **712** may also be specified. For example, a particular user may define particular events **208** which they prefer to generate storylines **134** about. Other parameters **714** may be specified, such as a threshold number of tags **132** required to generate a separate storyline **134**.

Different storyline determination parameters **616** may be applied with storylines **134** of differing scope, the scope ranging from globally across all users to an individual user or group of users. For example, a global storyline **134** which is accessible to all users may specify the estimated tag reliability **702** but omit a duration threshold **706**. In comparison, a user-specific version of the same storyline **134** may be based on the global storyline **134** but apply a duration threshold **706**. The user-specific version of the storyline **134** may be considered a subset of the global storyline **134**.

FIG. **8** illustrates **800** a storyline **134** comprising multiple occurrences of a particular tag **132** value throughout the content **124**. In this illustration, the character storyline **304**(**2**) is depicted, along with a timeline of the complete content **404** and various events **208** associated with the character of "Chet." Also indicated is the extent of different chapters **802** in the content **124**. The content **124**, such as a movie distributed on a DVD, may have several different chapters. The chapters **802** may correspond to scenes in the content **124**. In this illustration, seven chapters **802**(**1**), **802**(**2**), . . . , **802**(**7**) are depicted.

At each of these events **208** a tag **132**(**7**)-(**11**) has been generated. The storyline module **628** has generated the storyline **304**(**2**) from the tags **132** which share a common description **210**, that of "<character>Chet</character>". These tags reference the same character, "Chet," but are associated with different locations or portions of content. These tags may be in the same or different chapters **802** in the content. For example, the tags **132**(**7**) and **132**(**8**) are both in the chapter **802**(**1**), while a single tag **132**(**9**) is found in chapter **802**(**3**). During presentation of the content **132** as defined by the storyline **134**, the user may thus see only portions of a particular chapters, in particular those portions which are indicated by the occurrence time **212** tags **132**, instead of the entire chapter.

In one implementation, during presentation of the content **132** as defined by the storyline **134**, the user may experience a sequential flow of the events **208** indicated by the tags **132** in a particular arrangement. This arrangement may be by increasing time within the content **124**. For example, as shown here the user would be presented first with the scene "the gang's all here", followed by "hard ride," "trouble arises," "roping," "looking for trouble," "coffee's on," and "back to the barn."

Illustrative Processes

FIG. **9** illustrates a flow diagram **900** of a process for manually generating tags **132** associated with the content **124**. This user interface may be configured to couple with the server interface module **620** to accept the input. For example, during post-production of content one or more production users may use a web-based user interface to manually enter tags **132**.

Block **902** presents a portion of the content **124** to the user. Block **904** receives user input descriptive of one or more of a character, location, theme, or other event **208** or event **208** components which are present in the portion of the content **124**. For example, the user may enter information indicating that the portion of content from 7:07 to 11:17 includes the character of "Merle."

Block **906** generates one or more tags **132** based at least in part on the input. For example, the tag generation module **626** may generate the tag **132**(**4**) for the event **208** of the appearance of the character "Merle."

Block **908** associates the one or more tags **132** with the portion of the content **908**. For example, the tag **132** may include the content location reference **212**. In other implementations, the tag **132** may be associated with a particular portion of the content **124**.

In one implementation the user input from a plurality of users may be used to validate a given tag **132**. For example, several users may need to enter the same or similar tags **132** before the tag **132** is used to generate a storyline **134**. In another implementation the user may be presented with an automatically generated tag **132** and be asked to validate the tag **132** is correct.

FIG. **10** illustrates a flow diagram **1000** of an automated process for generating tags associated with the content **124**.

This process may be implemented by the device **104**, server **118**, or both. While the process is described below using a singular reference to the content **124**, in other implementations the process may be applied to one or more pieces of content **124**. For example, the tags may be generated for content **124** comprising an entire television series.

Block **1002** accesses at least a portion of content **124**. For example, the content **124** may be video content such as the movie "Burnt Sage."

Block **1004** determines the content metadata **130** associated with the content **124**. The content metadata **130** may be associated with one or more occurrence times **212** in the content **124**, the entire piece of content **124**, and so forth. For example, the content metadata **130** may comprise the genre **130(2)** and the characters/casting data **130(3)**, a scene or chapter listing indicating intervals within which those scenes or chapters appear, production notes for particular scenes or chapters, and so forth.

Block **1006** generates one or more tags **132** associated with the content **124** based at least in part on information in the content metadata **130** and the one or more occurrence times **212**. For example, the content metadata **130** may provide information about production notes such as the type of camera used to generate an image where the content **124** is video content. The one or more tags **132** may refer to the portions of the content recorded with the camera.

In some implementations, the content metadata **130** may be used with other information to generate the tags **132**. For example, as described below, with regard to block **1008**, using information about the cast found in the content metadata **130**, facial recognition may be used to determine that in one scene Clint Woods, John Morrison, and Harry Coburn who play the characters of Ed, Chet, and Johnny, respectively, are present. This may be used to generate tags indicating where the characters appear in the content **124**.

Block **1008** determines person data indicative of appearance of a person in the content **124** at the one or more occurrence times **212** in the content **124**. The recognition module **624** may be configured to use facial recognition to distinguish and identify different faces. In one implementation, the determination may be distinguishing one person from another without identifying the person. For example, the system may determine that a scene includes two different characters but has not determined their identity. In another implementation, the determination may include identifying the person, such as associating the person with a character name, actor name, and so forth. As described above, information about the cast found in the content metadata **130** may be used to aid in this determination with identification.

Block **1010** generates one or more of tags **132** associated with the content **124** based at least in part on the determined person data and the one or more occurrence times **212**. For example, the tag may specify that the character "Merle" has an occurrence time **212** from time 07:07 to 11:17 in the content **124**.

Block **1012** determines location data indicative of a location associated with the content **124** at the one or more occurrence times **212** in the content **124**. For example, the location data may be determined based at least in part on content metadata **130** such as production notes indicating where the content **124** was recorded. Or the recognition module **624** may use image recognition to determine a location based on images appearing in the content **124**, where the content **124** includes imagery. For example, the recognition module **624** may use optical character recognition to read the sign on an exterior image of "Ed's Mercantile" to determine the location as "Ed's Mercantile."

Block **1014** generates one or more of the plurality of tags associated with the content **124** based at least in part on the determined location data and the one or more occurrence times **212**. Continuing the example of FIG. **2**, the tag **132** may indicate that the location is "Ed's Mercantile" with an occurrence time of 04:13 to 11:17 in the content **124**.

Block **1016** determines object data indicative of an object appearing in the content **124** at the one or more occurrence times **212**. For example, the recognition module **624** may identify a saddle in the image.

Block **1018** generates one or more tags **132** associated with the content **124** based at least in part on the determined object data and the one or more occurrence times **212**. For example, the tag **132** may indicate that a saddle appears at times 51:13 to 55:21.

Block **1020** determines text data associated with the one or more occurrence times **212** in the content **124**. The text data may comprise information from retrieving one or more text captions, recognizing speech with a speech recognition module, or recognizing writing with an optical character recognition module. For example, the recognition module **624** may use optical character recognition to read signs or text appearing in video content **124**. The text data may also be based at least in part on closed captions, open captions, subtitles, and so forth.

Block **1022** generates one or more tags associated with the one or more pieces of content **124** based at least in part on information in the determined text data and the one or more occurrence times **212**. For example, where the text is generated from dialogue with two characters discussing "Chet", a tag **132** associating the event **208** of the dialogue may be generated.

FIG. **11** illustrates a flow diagram **1100** of a process for generating one or more storylines. This process may be implemented by the device **104**, server **118**, or both. As described above, while the process is described below using a singular reference to the content **124**, in other implementations the process may be applied to one or more pieces of content **124**. For example, a storyline **134** may be generated which extends across a television series and subsequent spinoff series.

Block **1102** accesses the content **124**, or a portion thereof. In some implementations, block **1102** may be omitted. Block **1104** accesses a plurality of tags **132** associated with the content **124**. As described above, the tags **132** may comprise information indicative of events **208** in the accessed content **124** and the occurrence times **212**. For example, the tags **132** generated as described above with regard to FIG. **10** may be accessed.

As also described above, the events **208** may include, but are not limited to appearance of a particular character in a portion of the content, appearance of a particular object in a portion of the content, a particular location in a portion of the content, dialog associated with a portion of the content, or, a particular sound in a portion of the content.

The storyline **134** may combine tags **132** which are associated with different events **208**. In some implementations, block **1106** may determine a correlation between two or more tags **132**. This correlation may indicate that the tag **132(1)** for the location "Ed's Mercantile" may have a correlation with the tag **132(3)** for the character "Ed". This correlation may be used to determine which groupings of tags **132** form relationships which may be relevant to the user during presentation. For example, tags **132** indicating appearance of "Chet" and "Johnny" may be highly correlated, and a storyline **134** may be generated as described next which includes tags for both characters. The storylines

134 may thus include tags which have different descriptions 210 but are correlated so as to correspond to a particular theme. Continuing this example, the theme may be the relationship between the characters "Chet" and "Johnny."

In another implementation, different tags 132 may be manually combined. For example, the activity storyline 306 of "riding" may be based on a combination of tags indicating cowboys and horses.

Block 1108 generates one or more storylines 134. The generating may comprise selecting one or more tags 132 based on one or more criteria, arranging the selected one or more tags 132, and storing the arrangement of the selected one or more tags 132 as the storyline 134.

The selection of the one or more tags 132 may be based on one or more criteria applied to the description 210 and in some implementations the occurrence time 212. The one or more criteria may include a character name, an actor name, a theme, a plot line, a location, an object, or an activity. For example, tags 132 containing description information 210 indicating a particular character may be selected.

The arranging may comprise sorting the tags 132 by the occurrence time 212 in ascending order from lowest occurrence time 212 to greatest occurrence time 212. This arrangement provides a sequential presentation of the content 124 designated by the storyline 134. In other implementations, other arrangements may be used, such as arranging by increasing time of the chronology of the story. For example, a storyline 134 for a character which features may flashback and flash-forward scenes may result in a storyline which presents the scenes showing the flashbacks first, consistent with their earlier appearance in the internal chronology of the story as being earlier events. The storing may comprise writing the arrangement in the CRSM such as the memory 108 of the device 104 or the memory 604 of the server 118.

In implementations where the correlation between the tags 132 is to be considered, the criteria for the selecting the one or more tags may include the tags 132 having a determined correlation with one another greater than the correlation threshold 704.

The storyline 134 comprises a data structure associating tags 132 with their corresponding descriptions 210 and occurrence times 212 across time in the content 124. For example, the tags 132 which reference the same character of "Chet" may be used to generate the character storyline 304(2). The storyline 134 may be configured to present portions of the content designated by the plurality of tags 132 while omitting portions of the content 124 undesignated by the plurality of tags 132.

Block 1110 generates a stream of the content 124 comprising portions of the content 124 indicated by the one or more storylines. Block 1112 sends the stream of the content 124 to the device 104. As described above, the one or more portions of the content 124 which are not designated may be omitted from sending. In some implementations the one or more storylines 134 may be provided to the device 104, which may then select from locally stored content or direct the server 118 to deliver the portions designated in the storyline 134 in the sequence indicated by the storyline 134.

In some implementations the server 118 may deliver to the device 104 a data structure which comprises the occurrence times associated with the portions of the content indicated by the tags 132 in the storyline 134. The device 104 may then request the specific occurrence times from the server 118, or skip through the content 124 delivered by the server 118.

FIG. 12 illustrates a flow diagram of a process for modifying an existing storyline. This process may be implemented by the device 104, server 118, or both. Over time a storyline 134 may dynamically change by splitting, being copied and used to start new storylines 134, be merged with other storylines 134, and so forth. For example, a storyline 134(10) may have a plurality of tags 132 which are highly correlated to the tags 132 in another storyline 134(11). The storyline 134(11) may be merged into the storyline 134(10.) As mentioned above, the storylines 134 may dynamically change due to the addition or removal of tags 132, addition or removal of content 134 which is associated with the storyline 134, and so forth. For example, the storylines 134 for the "Burnt Sage" series may be updated as new episodes of "Burnt Sage Revisited" are added and new books in the series are published. While the process is described below using a singular reference to the content 124, in other implementations the process may be applied to one or more pieces of content 124, such as the works in the "Burnt Sage" series.

Block 1202 accesses one or more pieces of content 124, or portions thereof. For example, the content "Burnt Sage" and "Burnt Sage Revisited" may be retrieved from the datastore 614. In some implementations, block 1202 may be omitted.

Block 1204 accesses a storyline 134 associated with the one or more pieces of content 124. As described above, the storyline 134 comprises one or more existing tags 132.

Block 1206 accesses one or more additional tags associated with the content 124. For example, these may be tags 132 generated as described above for a new episode of "Burn Sage Revisited" or a new movie in the series.

Block 1208 determines a correlation between the one or more additional tags and the one or more existing tags in the storyline 134. The one or more existing tags are those which make up the storyline 134. This correlation thus provides for the addition of tags 132 to the existing storyline 134. In some implementations the tags 132 from one storyline 134 may be subsumed into another storyline 134 as described above.

Block 1210 selects one or more of the additional tags having a correlation with the one or more existing tags which is greater than a correlation threshold. For example, an additional tag 132 such as of the character "Johnny" which is highly correlated to the existing tag 132 of the character storyline 304(1) may be selected.

Block 1212 adds the selected one or more additional tags 132 to the storyline 1212. The additional tags 132 may be added to the storyline 134 such that the arrangement of the tags in sequence is maintained. With these additional tags 132, the storyline 134 is now updated to include additional material, such as from a new episode.

In some implementations the storyline 134 may be pruned. Block 1214 determines one or more tags 132 in the storyline 134 having a correlation with other tags in the storyline 134 which is below the correlation threshold. The correlation threshold may be static or dynamically adjustable. Block 1216 removes the one or more tags 132 below the correlation threshold from the storyline 134. In some implementations, the one or more removed tags 132 may used to form a separate storyline 134, or may be added to another existing storyline 134. Block 1218 may store the modified storyline, which now comprises the one or more additional tags and no longer comprises the one or more removed tags.

Block 1220 generates a stream of the content 124 comprising portions of the content 124 indicated by the one or more storylines. Block 1222 sends the stream of the content

124 to the device 104. For example, as described above, the stream may comprise the entire content from which the device 104 presents the particular portions indicated by the storyline 134. In another example, the stream may comprise only those portions designated in the storyline 134.

FIG. 13 illustrates a flow diagram 1300 of a process for presenting one or more storylines. This process may be implemented by the device 104, server 118, or both. Block 1302 accesses the content 124. Block 1304 accesses one or more storylines 134 associated with the content 124. For example, these may be storylines 134 generated by the storyline module 628.

Block 1306 presents a user interface configured to receive selection by a user of one or more of the storylines 134. For example, the user interface 300 may be presented showing the various storylines 134 for the content 124 "Burnt Sage." As described above, the user may select one or more of the storylines 134 for presentation.

In some implementations the order of presentation of the various storylines 134 may be based at least in part on one or more of the storyline determination parameters or other parameters associated with the storylines 134. For example, a storyline 134 which has tags 132 which are highly correlated with one another may presented at a beginning of a list of available storylines 134, while the storyline 134 which has the tags 132 with the lowest correlation to one another may be presented at an end of the list.

Block 1308 receives user input indicative of a selection from the user interface. For example, the server 118 or the device 104 may receive the selection from the user's cursor 310 to watch the character storyline 304(1) for "Johnny."

Block 1310 presents one or more portions of the content 124 designated by the selected one or more storylines 134. As described above, the one or more portions not designated may be omitting from presentation. In some implementations the one or more portions not designated may be omitted from streaming or transmission, such that only the designated portions are provided to the device 104.

In some implementations the presentation of the storylines 134, or the selection thereof, may be incorporated into the presentation of the content. For example, during the opening scene at "Ed's Mercantile" the various characters may leave at different times or through different exits. The user may be presented with a user interface which allows them to "follow" that character, thus selecting the storyline associated with the particular character. This "following" may include presentation of content 124 which shows the camera point of view changing to appear to follow the character as they exit.

CONCLUSION

The operations and processes described and shown above may be carried out or performed in any suitable order as desired in various implementations. Additionally, in certain implementations, at least a portion of the operations may be carried out in parallel. Furthermore, in certain implementations, less than or more than the operations described may be performed.

Certain aspects of the disclosure are described above with reference to block and flow diagrams of systems, methods, apparatuses, and/or computer program products according to various implementations. It will be understood that one or more blocks of the block diagrams and flow diagrams, and combinations of blocks in the block diagrams and the flow diagrams, respectively, can be implemented by computer-executable program instructions. Likewise, some blocks of the block diagrams and flow diagrams may not necessarily need to be performed in the order presented, or may not necessarily need to be performed at all, according to some implementations.

These computer-executable program instructions may be loaded onto a special-purpose computer or other particular machine, a processor, or other programmable data processing apparatus to produce a particular machine, such that the instructions that execute on the computer, processor, or other programmable data processing apparatus create means for implementing one or more functions specified in the flow diagram block or blocks. These computer program instructions may also be stored in a computer-readable storage media or memory that can direct a computer or other programmable data processing apparatus to function in a particular manner, such that the instructions stored in the computer-readable storage media produce an article of manufacture including instruction means that implement one or more functions specified in the flow diagram block or blocks. As an example, certain implementations may provide for a computer program product, comprising a computer-readable storage medium having a computer-readable program code or program instructions implemented therein, said computer-readable program code adapted to be executed to implement one or more functions specified in the flow diagram block or blocks. The computer program instructions may also be loaded onto a computer or other programmable data processing apparatus to cause a series of operational elements or steps to be performed on the computer or other programmable apparatus to produce a computer-implemented process such that the instructions that execute on the computer or other programmable apparatus provide elements or steps for implementing the functions specified in the flow diagram block or blocks.

Accordingly, blocks of the block diagrams and flow diagrams support combinations of means for performing the specified functions, combinations of elements or steps for performing the specified functions and program instruction means for performing the specified functions. It will also be understood that each block of the block diagrams and flow diagrams, and combinations of blocks in the block diagrams and flow diagrams, can be implemented by special-purpose, hardware-based computer systems that perform the specified functions, elements or steps, or combinations of special-purpose hardware and computer instructions.

Many modifications and other implementations of the disclosure set forth herein will be apparent having the benefit of the teachings presented in the foregoing descriptions and the associated drawings. Therefore, it is to be understood that the disclosure is not to be limited to the specific implementations disclosed and that modifications and other implementations are intended to be included within the scope of the appended claims. Although specific terms are employed herein, they are used in a generic and descriptive sense only and not for purposes of limitation.

The invention claimed is:

1. One or more non-transitory computer-readable media storing computer-executable instructions that, when executed by at least one processor, configure the at least one processor to perform operations comprising:

accessing data comprising video content, wherein the video content comprises metadata associated with a cast of characters that appear in the video content;

determining character recognition data indicative of a plurality of characters in the video content at one or

more people appearance times in the video content, wherein the plurality of characters are selected from the cast of characters;

automatically generating a plurality of tags based at least in part on the character recognition data, the metadata, and the one or more people appearance times, each tag of the plurality of tags comprising text describing onscreen actions performed by a character of the one more characters;

determining a reliability metric for a first tag of the plurality of tags, wherein the reliability metric represents a correlation between the first tag and a first character of the plurality of characters;

determining that the reliability metric satisfies a reliability threshold;

generating a storyline, the generating comprising:

selecting a first number of tags of the plurality of tags, the first number of tags being associated with reliability metrics satisfying the reliability threshold, wherein the first number of tags comprises the first tag;

arranging the first number of tags by the people appearance times to form an arrangement;

storing the arrangement as a storyline based at least in part on the text describing the onscreen events; and

providing the storyline to a device.

2. The computer-readable media of claim **1**, the operations further comprising:

determining that a user account is associated with a payment for a first portion of the video content designated in the storyline; and

delivering the first portion of the video content to a device associated with the user account, while omitting the second portion of the video content that is not associated with the payment.

3. The computer-readable media of claim **1**, wherein the reliability metric is a first reliability metric, the operations further comprising:

receiving a user input for a second tag associated with the video content;

determining that the second tag is a user-generated tag; and

assigning the second tag a second reliability metric greater than the first reliability metric.

4. One or more non-transitory computer-readable media storing computer-executable instructions that, when executed by at least one processor, configure the at least one processor to perform operations comprising:

accessing a plurality of tags associated with one or more pieces of content, each of the plurality of tags comprising information that describes storyline actions that are performed by a plurality of characters during playback of the one or more pieces of content, wherein each storyline action is associated with a particular character and a particular time during playback of the one or more pieces of content;

determining that a first tag of the plurality of tags is a user-generated tag;

determining that a second tag of the plurality of tags is an automatically generated tag;

determining that a reliability metric for the second tag satisfies a reliability threshold, wherein the reliability metric represents a correlation between the first tag and a first character of the plurality of characters; and

generating a storyline, the generating comprising:

selecting a first number of tags from the plurality of tags based on one or more criteria;

arranging the first number of tags in an arrangement, wherein the first number of tags comprises the first tag; and

storing the arrangement as the storyline.

5. The computer-readable media of claim **4**, the events comprising one or more of:

appearances of the particular character during playback of a portion of the one or more pieces of content, wherein the particular character is selected from a cast of characters associated with the one or more pieces of content,

appearances of a particular object during playback of a portion of the one or more pieces of content,

particular onscreen locations during playback of a portion of the one or more pieces of content,

instances of dialog associated with playback of a portion of the one or more pieces of content, or

particular sounds during playback of a portion of the one or more pieces of content.

6. The computer-readable media of claim **4**, wherein the criteria for the selecting the first number of tags comprises one or more of:

a character name, an actor name, a theme, a plot line, a location, an object, or an activity.

7. The computer-readable media of claim **4**, wherein arranging the first number of comprises sorting the first number of tags in ascending order from a lowest occurrence time during playback to a greatest occurrence time during playback.

8. The computer-readable media of claim **4**, wherein selecting the first number of tags comprises selecting two tags, the generating the storyline further comprising:

determining a correlation between the two tags selected from the plurality of tags; and

wherein the criteria for the selecting the two tags comprises the first tag having a determined correlation with a second tag that is greater than a correlation threshold.

9. The computer-readable media of claim **4**, the operations further comprising:

determining content metadata associated with each particular time for each respective storyline action; and

generating at least one of the plurality of tags associated with the one or more pieces of content based at least in part on information in the content metadata, wherein the content metadata comprises at least one of a title, genre, or cast of characters of the one or more pieces of content.

10. The computer-readable media of claim **4**, wherein the storyline action comprises an appearance of the particular character and a character interaction between the particular character and another character during playback of the one or more pieces of content at the particular time; and

the operations further comprising:

determining character data indicative of the characters appearance at the particular time during playback of the one or more pieces of content; and

generating at least one of the plurality of tags associated with the one or more pieces of content based at least in part on the determined character data and the particular time.

11. The computer-readable media of claim **4**, wherein the one or more pieces of content is a single piece of continuous content, and the event comprises an appearance of an onscreen location during playback of the one or more pieces of content at the particular time during playback of the one or more pieces of content, wherein the onscreen location is

identified in content metadata associated with the single piece of continuous content; and

the operations further comprising:

determining location data indicative of the onscreen location associated with the-single piece of continuous content based at least in part on the content metadata; and

generating at least one of the plurality of tags associated with the single piece of continuous content based at least in part on the determined location data and the particular time.

12. The computer-readable media of claim **4**, wherein the event comprises an appearance of an object during playback of the one or more pieces of content at the particular time during playback of the one or more pieces of content; and the operations further comprising:

determining object data indicative of the object during playback of the one or more pieces of content at the particular time during playback of the one or more pieces of content; and

generating at least one of the plurality of tags associated with the one or more pieces of content based at least in part on the determined object data and the particular time.

13. The computer-readable media of claim **4**, the operations further comprising:

determining text data associated with the particular time; and

generating at least one of the plurality of tags associated with the one or more pieces of content based at least in part on information in the determined text data and the particular time.

14. The computer-readable media of claim **13**, the determining the text data comprising one or more of:

retrieving one or more text captions,

recognizing speech with a speech recognition module, or

recognizing writing with an optical character recognition module.

15. The computer-readable media of claim **4**, the operations further comprising:

generating a stream of the storyline, the stream comprising the one or more pieces of content indicated in the arrangement; and

providing the stream of content to a device for presentation.

16. The computer-readable media of claim **4**, the operations further comprising:

determining that a user account has made a payment for the storyline;

determining that the storyline comprises a first portion is a first episode and a second portion in a second episode;

presenting the first portion of the first episode and the second portion of the second episode on a device associated with the user account; and

omitting a first remainder of the first episode and a second remainder of the second episode.

17. A method comprising:

accessing a plurality of tags associated with one or more pieces of content, each of the plurality of tags comprising information that describes storyline actions that are performed by a plurality of characters during playback of the one or more pieces of content, wherein each storyline action is associated with a particular character and a particular time during playback of the one or more pieces of content;

determining that a first tag of the plurality of tags is a user-generated tag;

determining that a second tag of the plurality of tags is an automatically generated tag;

determining that a reliability metric for the second tag satisfies a reliability threshold, wherein the reliability metric represents a correlation between the first tact and a first character of the plurality of characters; and

generating a storyline, the generating comprising:

selecting a first number of tags from the plurality of tags based on one or more criteria;

arranging the first number of tags in an arrangement, wherein the first number of tags comprises the first tag; and

storing the arrangement as the storyline.

18. The method of claim **17**, wherein the events comprise one or more of:

appearances of the particular character during playback of a portion of the one or more pieces of content, wherein the particular character is selected from a cast of characters associated with the one or more pieces of content,

appearances of a particular object during playback of a portion of the one or more pieces of content,

particular onscreen locations during playback of a portion of the one or more pieces of content,

instances of dialog associated with playback of a portion of the one or more pieces of content, or

particular sounds during playback of a portion of the one or more pieces of content.

19. The method of claim **17**, wherein the criteria for the selecting the first number of tags comprises one or more of:

a character name, an actor name, a theme, a plot line, a location, an object, or an activity.

20. The method of claim **17**, wherein arranging the first number of tags comprises sorting the first number of tags in ascending order from a lowest occurrence time during playback to a greatest occurrence time during playback.

21. The method of claim **17**, wherein selecting the first number of tags comprises selecting two tags, the generating the storyline further comprising:

determining a correlation between the two tags selected from the plurality of tags; and

wherein the criteria for the selecting the two tags comprises the first tag having a determined correlation with a second tag that is greater than a correlation threshold.

22. The method of claim **17**, further comprising:

determining content metadata associated with each particular time for each respective storyline action; and

generating at least one of the plurality of tags associated with the one or more pieces of content based at least in part on information in the content metadata, wherein the content metadata comprises at least one of a title, genre, or cast of characters of the one or more pieces of content.

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